

EVERY-DAY
EDUCATOR

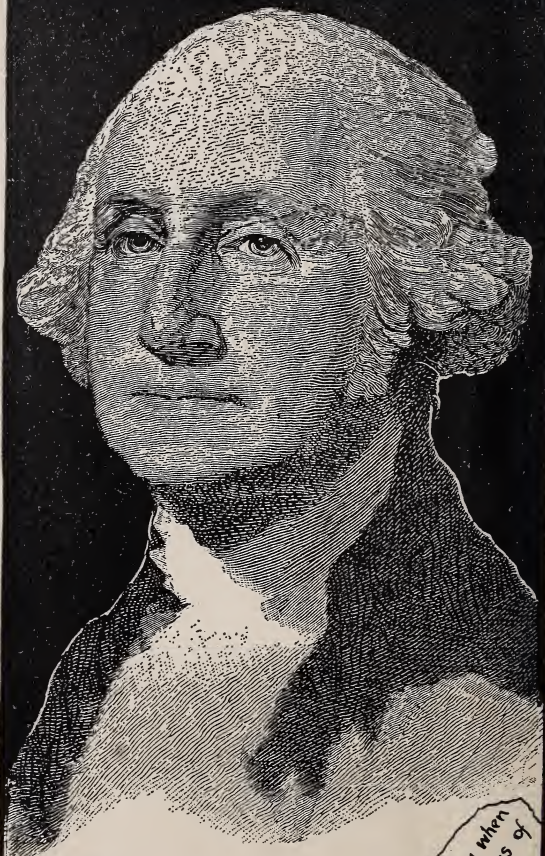
SEYMOUR EATON

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Every-day Educator

A MANUAL OF

SELF-INSTRUCTION

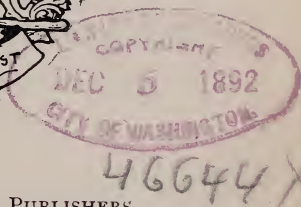
AND USEFUL INFORMATION

BY

✓
SEYMOUR EATON

Principal of BOSTON HOME COLLEGE

Author of "One Hundred Lessons in Business," "The New
Arithmetic," "Practical Grammar," "Manual of Correspondence,"
"Easy Problems for Young Thinkers,"
"Common-sense Exercise in Geography,"
"Civil Service Help Manual,"
"Lessons in Electricity,"
Etc., Etc.

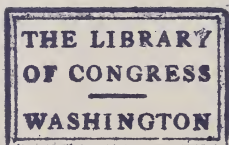


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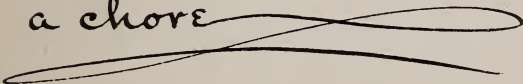
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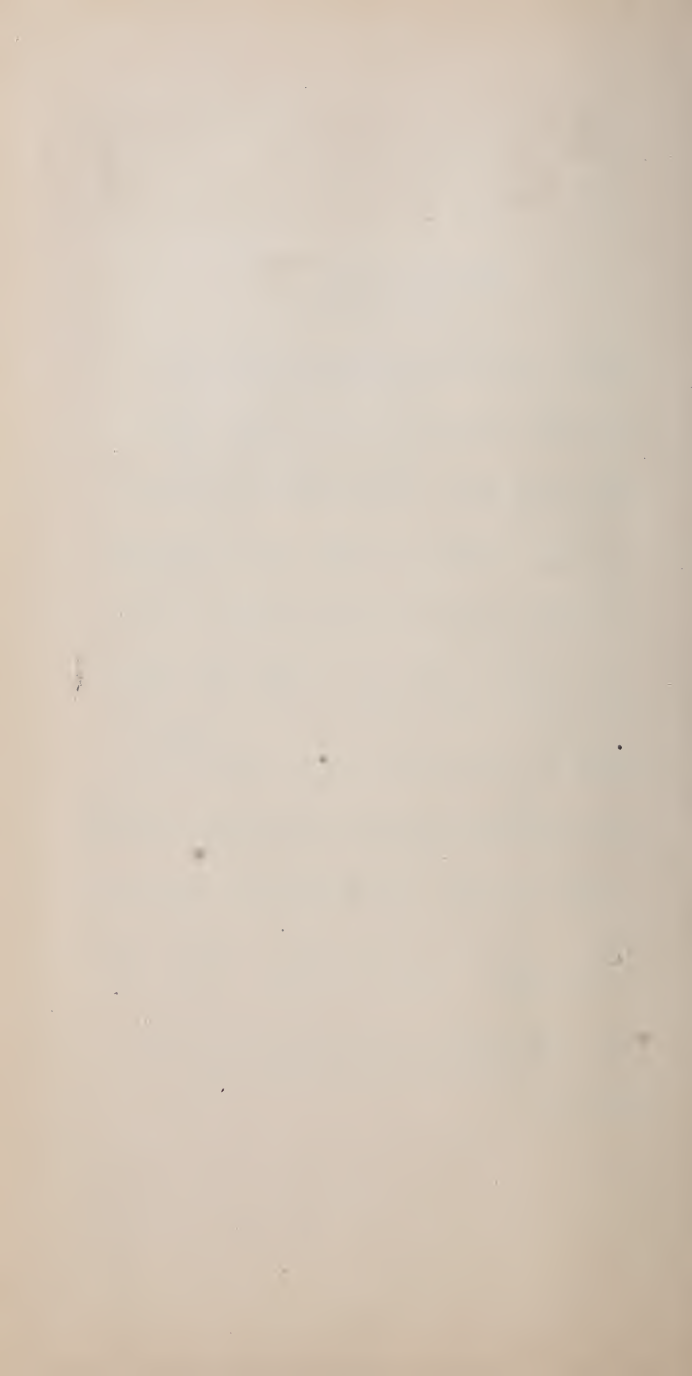


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Preface

The author has not a single bright idea left for the preface. He has used up the entire crop in the pages which follow. He sends out the little volume with the hope that its readers may gather something from its pages which will make ambitions more cheerful and life less of a chore







HINTS FOR HOME STUDENTS.

There is **no royal road** to learning. Money cannot buy an education. The boy born on the farm in the backwoods has an equal chance with the boy born in the city mansion. The largest benefit comes from the surmounting of difficulties. We learn to climb mountains only by climbing them. One boy may have ten times as many opportunities of gathering information as another, but **information is not education**. Growing minds are measured by the number of **original ideas** which they produce rather than by the quantity of facts which they contain.

Every educated man is, in some sense, **self-educated**. No teacher, whatever his abilities may be, can force an education upon an unwilling pupil; neither can any teacher educate a persistently idle pupil. The boy who has a love for study will die an educated man, no matter what the obstacles in his way. Read the life of Franklin, or of Webster, or of Lincoln, or of Garfield. These men were great in spite of early difficulties, and they owe their greatness largely to the fact that they had the **snap**, and **persistence**, and **ambition** to succeed. Almost any boy can do as much if he will add to his brain the necessary grit and perseverance.

Educated labor is always in demand. The men who are doing the longest day's work for the smallest daily wages, who are the slaves of their employers, are the uneducated. They don't know how to do anything else, and must do this one thing or starve. Ten or twenty years ago they spent their evening hours on packing boxes at the street corners, instead of learning then what they could have drawn wages for daily during after years. The educated mechanic is the **master mechanic**, and commands the highest salary. The

“foreman” knows more than you do and draws a heavier envelope.

Emerson said once that it did not matter so much what you study as **with whom you study**. This is true in a certain sense. If you read the life, and speeches, and letters of Lincoln and gather inspiration from them, you are really studying with Lincoln. Better get inspiration from a book, or a child, or a flower than a knowledge of Geometry or of Latin from the best teacher you ever knew. Inspiration is the germ. It is the longing desire to know more rather than the appreciation of what you already know.

Begin by choosing **a subject which you think you would like**. An error here is always serious, and sometimes leads to the abandonment of all effort in despair. Some one has said of the public schools that they spend three-fourths of the time putting into more complicated shape, things which the children know perfectly well already. There is no doubt about the fact that there is a great deal of time consumed on useless information which is forgotten before the books have had time to gather dust. The home-student has limited time and must use every moment to the best advantage. All knowledge is not equally profitable. The man whose education must be a partial one at best, should aim to make it embrace such subjects as will best serve his purposes. The object most commonly sought is **practical utility**. We study because learning and the intellectual culture it brings have a **market value**; because educated men can **make money** more readily and more surely than uneducated men can; because our education will open up to us more agreeable business pursuits than untaught men can follow. Never, however, lose sight of the **higher purpose of education**, which is nothing short of the development and growth of God in man.

Never before were so **many advantages** in the way of public libraries, reading clubs, literary societies, home-study colleges, and the best of periodicals, as at the present time. The boy or girl who grows up uneducated must not hold school, or teacher, or parent, or circumstances, wholly accountable.

“**Where there is a will there is a way.**”

OPINIONS OF SUCCESSFUL MEN STATESMEN AUTHORS MERCHANTS BANKERS INVENTORS EDUCATORS

WHAT THEY SAY OF SUCCESS.

Gladstone.—What is really wanted is to light up the spirit that is within a boy. In some sense and in some effectual degree, there is in every boy the material of good work in the world; in every boy, not only in those who are brilliant, not only in those who are quick, but in those who are solid, and even in those who are dull.

Henry Ward Beecher.—It is not work that kills men; it is worry. Work is healthy; you can hardly put more upon a man than he can bear. Worry is rust upon the blade. It is not the revolution that destroys the machinery, but the friction.

Benjamin Franklin.—Let all your things have their places; let each part of your business have its time. Resolve to perform what you ought; perform without fail, what you resolve. Lose no time; be always employed in something useful.

E. P. Roe.—The boy who resolves to do one thing honorably and thoroughly, and sets about it at once, will attain usefulness and eminence.

Sir Walter Scott.—Jock, when ye hae naething else to do, ye may be aye sticking in a tree; it will be growing, Jock, when ye're sleeping.

Charles Dickens.—Do all the good you can, and make as little fuss about it as possible.

Noah Porter.—Energy, invincible determination, with a right motive, are the levers that move the world.

Bishop Vincent.—An entire surrender of impulse and inclination to the demands of duty, as expressed and made possible in the life of Christ, is the great secret of true success.

Hon. Andrew D. White.—There are four conditions of success: first, soundness of mind and heart; second, clear judgment; third, fair knowledge of men; fourth, great devotion to some one purpose or study, but with breadth of view.

Wanamaker.—The four steps to success are: close application; integrity; attention to details; and discreet advertising.

Carlyle.—To one man who can stand prosperity, there are a hundred that will stand adversity.

Andrew Carnegie.—Young educated men have one important advantage over the apprenticed mechanic—they are open-minded and without prejudice. The scientific attitude of mind, that of the searcher after truth, renders them receptive of new ideas. Let no one, therefore, under-rate the advantage of education; only it must be education adapted to the end in view. Real ability, the capacity for doing things, never was so eagerly searched for as now, and never commanded such rewards. No man can keep another down.

Edison.—When you set out to do anything, never let anything disturb you from doing that one thing. This power of putting the thought on one particular thing, and keeping it there for hours at a time, takes practice; and it takes a long time to get into the habit.

Samuel Johnson.—Money and time are the heaviest burdens of life; and the unhappiest of all mortals are those who have more of either than they know how to use.

Longfellow.—Many men do not allow their principles to take root, but pull them up, every now and then, as children do flowers they have planted, to see if they are growing.

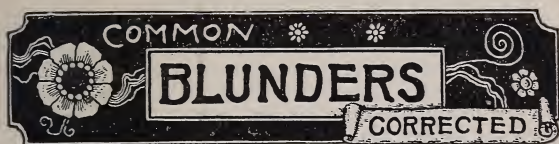
Macaulay.—The world generally gives its admiration, not to the man who does what nobody else ever attempts to do, but to the man who does best what multitudes do well.

Lincoln.—Let us have faith that right makes might; and in that faith let us, to the end, dare to do our duty, as we understand it.

Wilbur F. Crafts.—Whether a boy is from farm or city, rich or poor, weak or strong, talented or not, will and work are sure to win. Wishes fail, but wills prevail. Labor is luck.

Garfield.—Poverty is uncomfortable, as I can testify; but nine times out of ten the best thing that can happen to a young man is to be tossed overboard, and compelled to sink or swim for himself. In all my acquaintance I never knew a man to be drowned who was worth the saving.

Huxley.—A somewhat varied experience of men has led me, the longer I live, to set the less value on mere cleverness; to attach more and more importance to industry and physical endurance.



SLIPS OF TONGUE AND PEN.

Plurals. Be careful in writing such plurals as moneys, journeys, valleys, chimneys, turkeys, negroes, calicoes, buffaloes, sons-in-law, solos, twos, quartos, step-sons.

Verbs and number. Follow plural subjects with plural verbs; as, we *were*, not we was; you *were*, not you was; they *are*, not they is; they *were*, not they was; they *have*, not they has; they *write*, not they writes; the men *are*, not is; the children *were*, not was; the boys *have*, not has; my sisters *write*, not writes; these *are* the boys who *were* at school. Jennie and Annie *were* schoolmates.

To do; to see. These two verbs give considerable trouble. Their principal forms are, *do, did, done*, and *see, saw, seen*. The second forms, *did* and *saw*, should never follow *is, are, was, were, have, has, or had*. The third forms, *done* and *seen*, should always follow one of these words expressed or understood; as, I *did* the work, or I *have done* the work, or the work *is done*. I *saw* the picture, or I *have seen* the picture, or the picture *was seen*.

Verbs in general. The rules given for *to do* and *to see* apply alike to all verbs. Such expressions as *have came, has sang, was drove, have broke, have began, have knew, is froze, have gave, knowed, has went, has give, has rang, have ran, were took, has stole, throwed, have mistook*, etc., are gross errors and should be avoided.

Possessives. The possessive of nouns, both singular and plural, is formed by adding an apostrophe and "s" ('s); as, The *man's* hat is on the table. The *children's* play-ground is behind the house. When a plural noun ends in "s," only the apostrophe (') is added; as, The *pupils'* lessons should be explained. *Birds'* nests attract boys. The apostrophe is never used in forming the possessive of pronouns.

I, me, he, him, she, her. Many persons continually make mistakes in conversation and in correspondence in the use of these words. The following are examples: Let you and *I* go; say, *me*. He is as good as *me*; say, *I*. She is as tall as *him*; say, *he*. You are older than *me*; say, *I*. Nobody said so but *he*; say, but *him*. John went out with James and *I*; say, and *me*.

You are stronger than *him*; say, than *he*. Between you and *I*; say, you and *me*. He gave it to John and *I*; say, and *me*. Your brother was with Mrs. Brown and *I*; say, and *me*. He sat between him and *I*; say, *me*. *Me* and *him* can carry it; say, *he* and *I*. *Her* and her sister are coming; say, *she* and her sister. *Her* and *him* are the same age; say, *she* and *he*. Was it *her*; say, *she*. If *I was him*; say, *were he*.

We, us, they, them, who, whom. Errors in the use of these pronouns are frequent. *Us* boys enjoy the holidays; say, *we* boys. *Who* is it for? say, *whom*. Was it *them*? say, *they*. *Who* did he choose; say, *whom*. Who did the mischief? *Them*; say, *they*. Be careful *who* you trust; say, *whom*.

Comparison. Do not use the *superlative degree* where only two things are compared; as, he is the *best* of the two; say, *better*. Jennie is the *eldest* of my two sisters; say, *elder*. Avoid double *comparatives* and double *superlatives*; as, A *more healthier* location cannot be found; say, *more healthy*. He took the *most pleasantest* route; say, *most pleasant*, or *pleasanter*.

Negatives. Do not use two negative words so that they shall contradict each other; as, He *didn't* do *nothing*; say, *did nothing*, or *didn't do anything*. He is *not* there, *I don't* think; say, *I think*.

Adverbs. Do not use adverbs for adjectives, nor adjectives for adverbs; as, The river rises *rapid*; say, *rapidly*. He does his work *slow*; say, *slowly*. She looks *charming*, not *charmingly*; I feel *bad* over it, not *badly*. He did his work *well*, not *good*.

Prepositions. The needless insertion of a preposition is to be avoided, as, *In* what latitude is Boston in? Care must be taken to connect prepositions with appropriate verbs and nouns; as, This book is different *to* that; say, *from* that. I was followed *with* a crowd; say, *by* a crowd. He is angry *at* his father; say, *with* his father.

Collective Nouns. When the idea of *unity* is prominent, collective nouns take singular verbs; as, The fleet *was* under orders to sail. There *was* a large crowd in the building. Your committee *begs* leave to report. When the idea of *plurality* is prominent, collective nouns take plural verbs; as, The public *are* requested to be present.

Shall, will. *Will* expresses the will or pleasure of its own subject. *Shall* subordinates the will of its subject to that of the speaker. "We *will* go," means "we are willing to go." "We *shall* go," means "we have decided upon going." Never say "*Will* I do so

and so?" The literal meaning of such an expression would be, "Am I *willing* to do, etc." Remember that *will* always expresses *willingness* rather than *futurity* when it has a personal significance.

Similar tense forms. *Lie, lay, lain; lay, laid laid; sit, sat, sat; flee, fled, fled; fly, flew flown; flow, flowed, flowed; rise, rose, risen; raise, raised, raised.* His roommate *lies* in bed until noon. The apples *lay* on the ground all winter. He has *lain* on the floor since morning. He *laid* the book on the table. I have *sat* here for more than an hour. She *set* her pitcher on the ground. They will *flee* from the plague. The river has *overflowed* its banks. John *raised* the flag.

ERRORS TO BE AVOIDED.

Administer. Blows are *dealt*. Medicine is *administered*.

Afraid. Say I *fear* it will rain, not I am *afraid*.

Agriculturist. Not *agriculturalist*.

Alike. Do not couple this word with *both*.

All over. *Over* all the country, not *all over* the country.

Allow. Do not say, "He *allows* he will do it."

Alone. Distinguish this word from *only*.

Amateur. Not necessarily a beginner.

And. Say try *to* go, not try *and* go.

Angry. Say angry *with* a person and *at* a thing.

Answer. Answer *questions*; reply to assertions.

Anticipate. Distinguish from *expect*.

As. Say not *that* I know, instead of not *as* I know.

At all. Superfluous in "any *at all*."

Atheneum. Pronounce *ath-eh-nèe-um*. Accent 3d syllable.

Asphalt. Pronounce *ess-fahlt*, not *ash-fault*.

Awful. A thing cannot be *awful* pretty.

Balance. Not to be used for *rest* or *remainder*.

Beautifully. Looked *beautiful*, not *beautifully*.

Beg. Say "I *beg* leave to acknowledge."

Belongs to. Do not use for *is a member of*.

Between. *Between* two; *among* more than two.

Blacking. This word is not *blackening*.

Brakeman. Not *brakesman*.

Certain. Distinguish from *sure*.

Character. Distinguish from *reputation*.

Deal. Great *deal*, not good *deal*.

Die with. Persons die *of*, not *with* disease.

Disremember. Say *forget*.

Don't. Say he *doesn't* sing, not he *don't* sing.

Either. Means the one or the other of two.

Either alternative. Alternative means choice.

Equally well. Do not say *equally* as *well*,

Every. Followed by a verb in the singular.

- Expect. Refers to future time.
- Fix. Incorrectly used for *arrange* or *prepare*.
- Folk. *Folk* implies plurality as well as *folks*.
- Gent. Never use this contraction of *gentlemen*.
- Good. "It looks *good*." Say *well*.
- Got. Omit *got* in "I have *got* a dollar."
- Granary. There is no such word as *grainary*.
- Guess. Do not use this word for *suppose*.
- Had have. Never use together.
- Hardly. Do not use with *don't* and *can't*.
- Healthy. Distinguish from *wholesome*.
- Hundred. Use the singular form with numerals.
- Idea. This word is not *idea-r*.
- Just. Incorrect in the sense of *now*.
- Learn. To receive instruction. See *teach*.
- Less. Relates to quantity; *fewer* to number.
- Loan. *Lend* is considered a better word.
- May. Distinguish from *can*.
- Near. Do not use in the sense of *nearly*.
- New. "A pair of new boots"; not "a new pair."
- Nice. Think twice before using this word.
- None. Contraction of *no one*, takes singular.
- One. Followed by *one*, and not by *be*.
- Otherwise than. Not *otherwise but*.
- Party. Do not use this word for *person*.
- Perpetual. Distinguish from *continual*.
- Portion. Often incorrectly used for *part*.
- Portion. A *portion* is a *part* set aside.
- Posted. Do not use instead of *informed*.
- Prevalent. Distinguish from *prevailing*.
- Promise. Distinguish from *assure*.
- Propose. Distinguish from *purpose*.
- Prudence. Distinguish from *discretion*.
- Quantity. Things measured or weighed.
- Real. The adverb is *really*; as, *really* good.
- Remember. Distinguish from *recollect*.
- Returned back. The prefix *re* means back.
- Seem. Distinguish from *appear*.
- Settle. To *settle* does not mean to *pay*.
- Shampoo. Not *shampooon*. Shampooing.
- So, such. *So* long journeys, not *such* long.
- Some better. Say *somewhat* better.
- Splendid. Splendid things glitter.
- Stop. We *stay* at a certain hotel, not *stop*.
- Streamlet. Do not use with *little*.
- Summon. *Summon* is a verb, *summons* a noun.
- Teach. To give instruction. See *learn*.
- Those kind. Say *that kind*. *Kind* is singular.
- Transpire. Do not use for *to happen*.
- Try. We *make* an experiment, not *try*.
- Vacation. Distinguish from *vocation*.
- Widow woman. *Woman* is here superfluous.
- Without. Do not use *without* for *unless*.
- Year-old. A *two-year-old* colt, not a *two-years*.
- Yours. Never close letters with "*Yours, etc.*"



HINTS ON PUBLIC SPEAKING

Success is made up of a good deal more of hard work, and very much less of talent than most people suppose.

The **main essentials** are perseverance, a capacity for patient study, and common sense. Intelligent practice can work wonders. Your friend who plays so brilliantly, drummed away for months at five-finger exercises.

There are **other essential qualifications** — clearness of utterance, deliberation of manner, and repose of mind. The hurried man will stammer. The nervous man will flounder in his talk. The unready man will “hum” and “haw” until he becomes a bore to his audience.

A chart of the windpipe is of no more value to the public speaker than a picture of a bag-pipe is to the opera-singer. He has **no use** for the physiology of the voice. It is quite immaterial to him whether his voice is produced by the larynx or the calf of the leg. A bad voice is a bad habit, to be got rid of just as any other bad habit is to be got rid of, by turning the will upon it.

It is impossible to overestimate the importance of a good, trustworthy, uniform **articulation** to the public speaker. He can have no more useful form of ability than audibility. Distinctness is vital. Indistinctness is fatal. The whisper of a good speaker penetrates everywhere.

Some minds work best, most effectively, and expeditiously in and by the act of public speaking. Such men are public thinkers as distinguished from closet thinkers. As some cannot think or express their thoughts except in the seclusion of the study, so some are unable to think out their thoughts unless they speak them out.

There is **no better exercise** than the physical

earnestness of public speaking. It is as good for the liver as horseback riding. A pulpit sweat is better than a Turkish bath.

He is a rare speaker who knows how to hit the purpose of the occasion in a **brief speech**. The best of orators and advocates fail here. Any one might make the ten-minute speech if he were allowed ten minutes in which to get under way.

Always stick to the **advertised topic**. Never rub the audience the wrong way, unless indeed you have a case to argue with it, or an appeal to make for an unpopular cause.

The value of a vigorous, flexible, mellow **baritone for public speaking** cannot be over-estimated. It is a richly paying investment. It covers a multitude of minor sins. It compensates somewhat for deficiencies in rhetoric and thought. There is health, and dignity and character in it.

There are several **distinct types** of eloquence: First, the fluent. The speech falls from the lips with no apparent effort. We are impressed with the marvellous flow of language. Second, the **poetic**. A style full of imagery, frequent contrasts and striking comparisons, in which nature contributes to the rhythm of the address. Third, the **epigrammatic**. Much truth compressed into short sentences. The kernel without the husk. The gold, with dross refined away. Fourth, the **scholarly**. Full of well rounded sentences, and abounding in rare words. Fifth, the **logical**. Arranged orderly, each sentence suggesting the one which is to follow, and leaning back upon the one preceding. Easily remembered, because the unconscious reasoning of the mind has been assisted by the speaker. Sixth, the **persuasive**. Depends largely upon the manner of the speaker. His voice and eyes and posture add to his words. It is the style of deep feeling and intense passion.

The most **popular speakers** are those who simply suggest bright ideas or thoughts, leaving the entire development to the pleasure of the audience.



EVERY-DAY GEOGRAPHY

The **earth** is a great round ball, 25,000 miles in circumference and 8,000 miles in diameter. It turns on one of its diameters once in every 24 hours, and completes a circuit of the sun in one year. The daily motion causes **day and night**. The diameter around which the earth spins is not upright but leans about $23\frac{1}{2}$ degrees. This slanting position, together with the annual motion around the sun causes the **seasons**. In our summer the north pole is turned towards the sun, and in winter the south pole is turned towards the sun. See the illustrations on the next page.

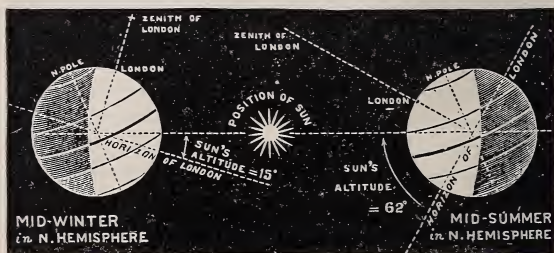
The middle day in spring is the **22d of March**. Then the day and night are each twelve hours long. The middle day in summer is the **22d of June**, when the days are the longest. The day is shortest on the **22d of December**. On the **22d of September** the days and nights are equal.

The **equator** is an imaginary line passing around the earth at equal distances from the poles. Distance north or south of the equator is called **latitude**. We may say that a particular wreck occurred in north latitude 43° . The distance east or west from a first **meridian** is called **longitude**. A meridian is a circumference line passing through the poles. The first meridian from which longitude is usually reckoned passes through Greenwich, near London, England.

The **atmosphere**, though greatly rarefied, must exist to a height of from 100 to 200 miles. **Water vapor** is always present in the atmosphere. In extremely cold air its quantity is very minute, but in hot air it may form one thirtieth part of the whole. **Carbonic acid** is also present in the air. It is given off to the atmosphere in the breath of animals, by the decay of vegetable matter, and by the combustion of fuel. Plants are largely composed of carbon, which they obtain from the carbonic acid of the air, and thus

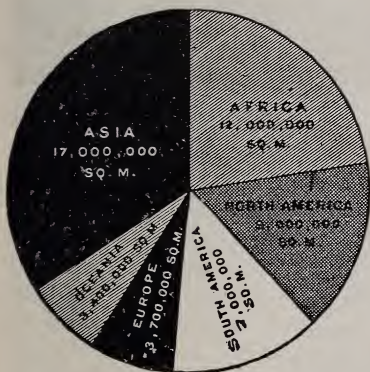
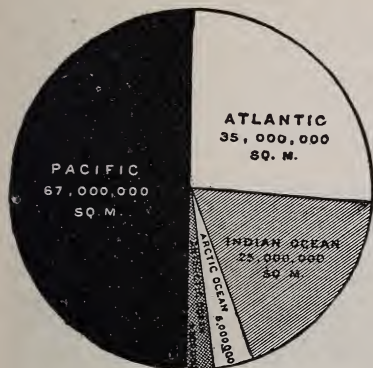
prevent its undue accumulation. The principal ingredients are **oxygen** and **nitrogen**. A cubic foot of air weighs about $1\frac{1}{4}$ ounces. The air is most dense at the sea-level, and becomes less dense as we climb mountains.

The power of the atmosphere to absorb and hold the direct and radiated **heat of the sun** makes our earth sufficiently warm to support life. Without this property of the atmosphere, the temperature of the



earth would, even under the direct rays of a tropical sun, never be greater than about 300° below zero. The solar rays does not penetrate deeply into the solid land, but it affects water to a depth of about 500 feet.

The atmosphere obtains its **moisture** from the water surface of the earth by the process of evaporation. Warm air can hold more water-vapor than cool air. When air at any given temperature contains all the vapor it can hold, it is said to be saturated. When saturated air is cooled, it can no longer hold all its vapor; a portion of it, therefore, condenses and falls as rain or snow. **Mist** consists of a vast multitude of minute globules of water in the air near the earth's surface. It is usually caused by the sudden cooling of saturated air. **Clouds** are merely fogs formed at some distance above the earth's surface. The mean elevation of clouds in the temperate zones is about one-half a mile, while the highest clouds ever seen are probably within ten miles of the earth's surface. Clouds stop much of the sun's heat, and so prevent the earth from becoming too hot during the day-

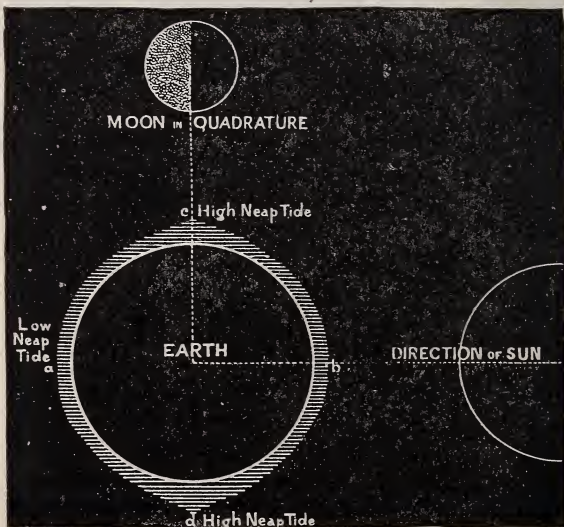


time; while, by absorbing and radiating back a portion of the heat which is constantly streaming off from the earth, they prevent its surface from becoming too cold at night. This is the reason why cloudy days are generally cooler, but cloudy nights warmer than fair ones. **Dew** differs from fog or cloud in being little globules of water condensed from the atmospheric vapor upon cool, solid bodies which have chilled the adjacent air below its point of saturation.

The **oceans** form three-fourths of the earth's surface. The accompanying diagrams illustrate the proportions of land and water very nicely. The greatest width of the **Pacific** ocean is about 10,000, and of the **Atlantic**, about 3,600 miles. The average **depth** of the sea is about $2\frac{1}{2}$ miles. There are places where the depth is much greater. The greatest depressions are about as far below, as the highest mountains are above the sea level. The water of the sea is so **salt** as to be undrinkable, and were this salt dried and laid out over all the land on the globe, it would cover it to a

depth of 500 feet. Sea-water, in evaporating, leaves all its impurities behind. Shallow water has a greenish tint, while the greater depths have an intense indigo-blue color. Where the water is deepest and purest—as in the Mid-Atlantic—it is intensely black, there being nothing to reflect light to the eye.

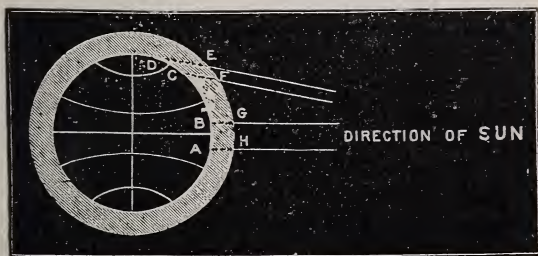
The cause of atmospheric electricity is still not very well known, but everyone is familiar with its manifestations during **thunder-storms**, which are really a series of electrical discharges from cloud to cloud, or sometimes between clouds and the earth. The visible flash is called **lightning**. The lightning and thunder are produced simultaneously, but an interval of a few seconds usually occurs between the two phenomena



reaching our senses, owing to the fact that sound does not travel so rapidly as light.

In obedience to the laws of gravitation the sun and the moon each exert an attractive influence upon the earth. Although the sun's mass is so very much greater than that of the moon—being twenty-eight

million times as great — yet the effect of the tide attraction of the sun is only seven-sixteenths that of the moon. One reason for this is that the sun is nearly 400 times farther off than the moon. The effect of this attraction is seen in the **ocean tides**. The water is drawn, or pulled out, as it were, towards the



attracting bodies. When the sun and moon are acting on the same side of the earth, the combined attraction produces the greatest possible rise of water, known as **spring tides**. When the sun and moon are pulling in opposite directions, **neap tides** are produced. Owing to the revolution of the earth on its axis in 24 hours, the tidal wave travels once around the earth in that time. And since the tidal wave is double — there being two points of high water — each sea-coast has high tide twice a day. But as the moon revolves around the earth it takes 54 minutes longer for a particular place to be brought opposite the moon again. Hence the tides are 54 minutes later every day. In the open ocean the water rises about four feet, but in bays and gulfs it may rise to 40 or 50 feet.

In addition to the forward and back movement of the water in wind and tidal waves, each ocean is traversed by systems of **currents**, or continuous movement of the water in the same direction. Several causes combine to produce these continuous currents; the principal cause, however, is the inequality in the density of the water in different parts of the sea, arising from differences in temperature and saltness.

Take a rectangular box or pan two or three feet long and a foot wide. Fill it with water. In one corner place a piece of ice and heat the corner diagonally opposite. The water will at once begin to move around making a complete circuit of the box or pan. This experiment will illustrate the movement of the ocean waters from one temperature to another.

The **direction** in which ocean currents flow is greatly modified by the rotation of the earth, the configuration of the coast and sea bottom and by prevailing winds. The great current known as the **Gulf Stream** has a wonderful influence upon the climate and commerce of America and Europe. The waters of this current have a high temperature, through having performed a long tropical journey across the Atlantic and along the coasts of South and Central America. In the Straits of Florida the Gulf Stream is 32 miles wide, and has a velocity of four miles an hour. The temperature here is 82°. The Gulf Stream flows northeast but is separated from the coast of the United States by a colder current from the north. The prevalent **fogs** of Newfoundland are caused by the meeting of these two currents in that region.



THE WORLD AS KNOWN TO THE ANCIENTS.

Were it not for the influence of this great current of warm water the British Isles would be as cold as Greenland or Labrador.

The **earth** has been examined to a depth entirely insignificant in comparison with its diameter, but so far as it has been examined, it appears to be composed mainly of twelve elements. These make up ninety-

nine one-hundredths of the earth's crust, and are: oxygen, silicon, aluminum, calcium, magnesium, potassium, sodium, carbon, hydrogen, sulphur, chlorine, and iron. Among the comparatively rare elements are all the useful metals, except iron. Geologists estimate



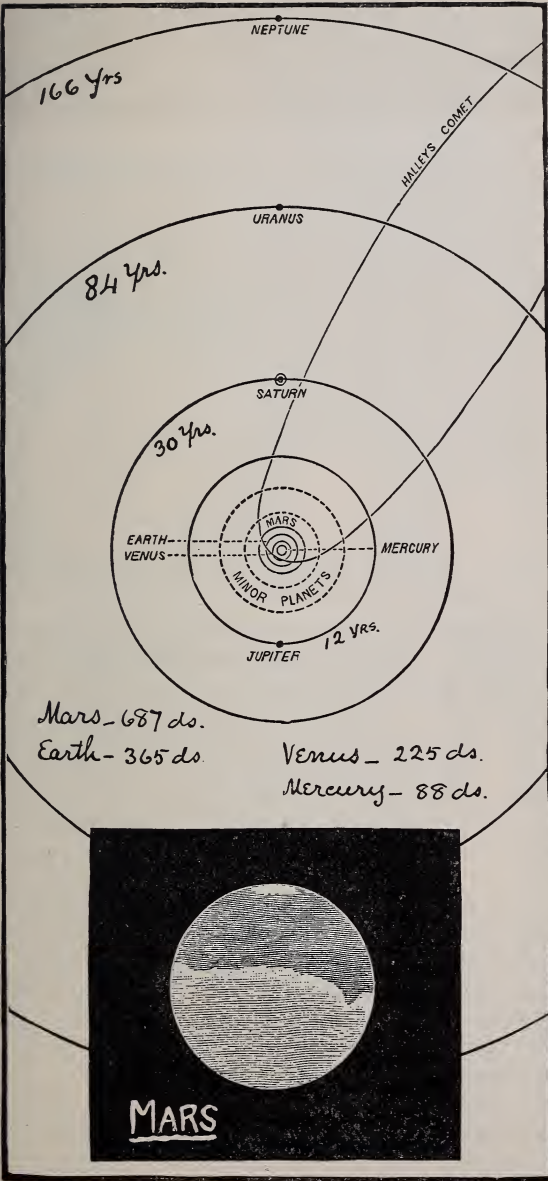
that at least 3,000,000 years must have elapsed since the oldest known sedimentary rocks were deposited.

In general, the number of all **forms of life** decreases with the temperature and moisture of the climate. Thus, in the equatorial regions, where heat and moisture are great and continuous throughout the year, the luxuriance of both animal and vegetable life is astonishing.



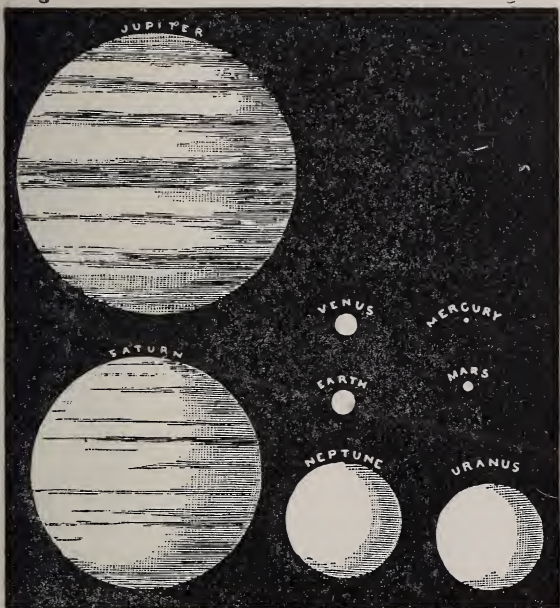
To the inhabitants of the earth and to those of the other planets, if there be any, the **sun** is the most magnificent, as well as the most important, object in the universe. All the planets move in their orbits under the influence of its attraction, and from its rays is derived the energy which produces almost every form of motion on their surfaces. Yet the sun is but one of the countless **stars** of the vast universe. It is probable that each *fixed* star is really a sun, and the centre of a separate system of planets. The nearest of these *fixed* stars is twenty billions of miles distant. It would take four years for the light of such a star to reach the earth. Sirius, the dog star, is calculated to be more than a million times farther away from us than the sun, so that light requires eighteen years to pass from this star to the earth.

The **sun**, the ruler of our system, is the nearest *fixed* star, and lies at a mean **distance** from it of 92,700,000 miles. Some idea of this distance may be obtained by considering that a train travelling day and night without stopping, at a rate of sixty miles an hour, would take 175 years to pass over it. The **diameter** of the sun is about 860,000 miles, or 109 times the diameter of the earth. If a globe two feet in diameter represent the sun, then a pea 215 feet away will correctly represent the comparative size and distance of the earth. Go out on a moonlight night and consider the moon's distance as it appears to us. Then imagine the earth to be placed inside the sun at centre, with the moon revolving around it as now, the revolutions could continue inside the sun, and yet the moon would not come nearer the surface of the sun than 190,000 miles. The **density** of the sun is only about one fourth of the density of the earth. We may, therefore, conclude that the sun is rather a mass

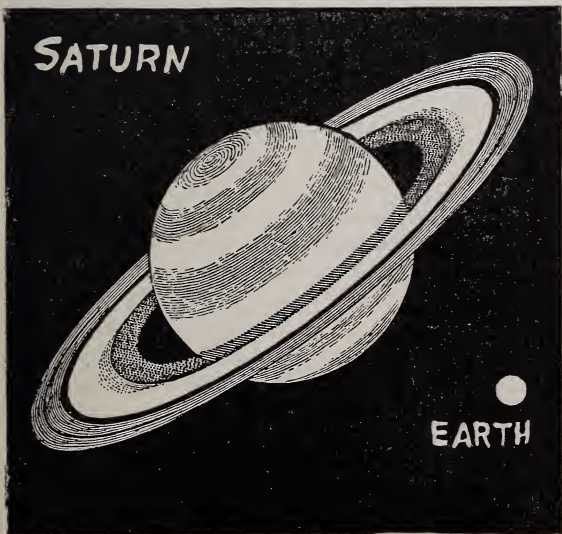


of vapor or gas than a solid body. At its centre, however, owing to the effects of gravity, it must of course be in a very condensed state. An article which would weigh one pound on the earth would weigh twenty-seven pounds on the sun. When the sun is **eclipsed** by the moon coming between us and it, and the blinding glare of its light cut off, we see that the surface, which is generally apparent to us is by no means the boundary of the solar orb, for around the body of the moon there appears a bright halo or glory, which spreads many thousands of miles into the regions of space and which is evidently a part of the sun. From the surface, flames of fire, or illuminated gas, are seen to rise sometimes to heights of 100,000 miles. The black spots which are often visible upon the brilliant surface are called **sun-spots**. These spots are very irregular in shape and of every conceivable form. They are often of an immense size, occasionally so large as to be distinctly visible by the naked eye. The largest spot yet measured was 144,000 miles in diameter. The sun gives out as much **light** as 146 lime-lights would do if each ball of lime were as large as the sun and gave out light from all parts of its surface. It is estimated that the **heat** given off by the sun is equivalent to the burning of 12,000 billions of tons of coal per second. It is estimated that the **temperature** of the sun's surface is 18,000° F. The sun weighs about 760 times as much as all the planets put together. It is a large subject and a very interesting one.

The **planets** are bodies much smaller than the sun around which, at different distances, they revolve, and from which receive most of their light and heat. The path of a planet around the sun is called its **orbit**. The planets shine (as stars) at night by reason of the sunlight which is reflected from their surface, while the sun and the fixed stars, shine by their own light. The most important planets are the following: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Mercury, Venus, Mars, Jupiter, and Saturn



are frequently visible from the earth as remarkably large and brilliant stars. Uranus is so distant as to be barely visible to the naked eye, and Neptune can never be seen without a telescope. **Mercury** is the nearest to the sun. Its year is equal to 87 days. When it is visible, it is either just before sunrise, or just after sunset. Its lustre is very brilliant and mountains of great height have been observed upon its surface. Its day is about the same length as ours. The earth is seventeen times larger than Mercury. The sun shines upon Mercury with about seven times the intensity that he does upon the earth. The atmosphere or local conditions may be such as to modify the heat. **Venus** is the next planet in distance and is nearly as large as the earth. It is 67 millions of miles from the sun. Its day is a little shorter than ours, and its year is equal to 224 of our days. Next to the sun and moon, Venus is the most conspicuous of the heavenly bodies. When it rises before the sun it is called the morning star and when it sets after the sun it is called the evening star. Our **Earth** is the next planet in distance. Then comes **Mars**, 141 millions of miles from the sun. Its year is equal to 687 days. Its day is a little longer than ours. This planet presents a beautiful appearance through a telescope. The parts supposed to be land have a reddish tint, which gives a ruddy appearance to the whole planet. The dark portions, which have a greenish color, are supposed to be seas. Snow can be seen around its poles. The surface is often obscured—presumably by clouds. Mars has two small moons. **Jupiter** is by far the largest of all the planets of our solar system. The diameter is 88,000 miles. Its distance from the sun is 482 millions of miles. Its year equals twelve of our years, and its day is only about ten hours. To an observer situated on Jupiter the sun would appear only about one-fifth of the diameter that he does to us on the earth. It is supposed to be surrounded by a very dense, cloudy atmosphere, and may yet be a heated mass, partly self-luminous. Jupiter is attended by five moons. The planet **Saturn** ranks next to Jupiter in size, having a

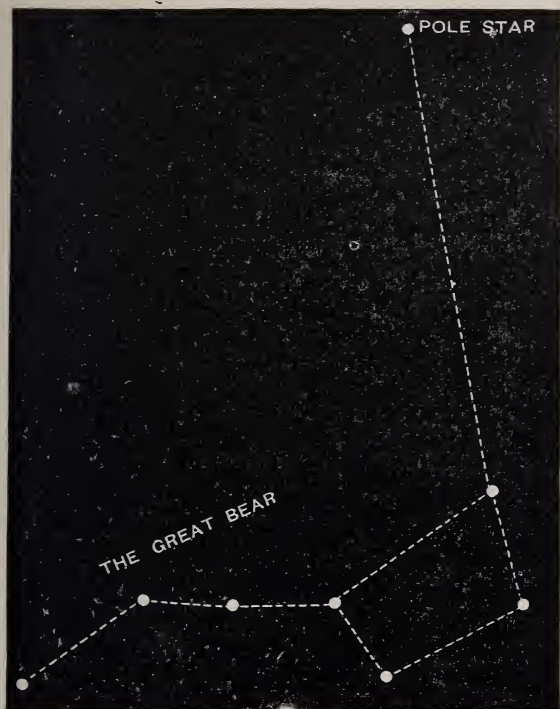


diameter of 71,000 miles. Its distance from the sun is more than nine times that of the earth. Its year equals almost thirty of ours, and its day is about 10 hours in length. Not only is Saturn accompanied by eight moons, but it is surrounded by a ring, or rather series of rings, which are about 10,000 miles distant from the planet. The total breadth of this ring system is about 38,000 miles, while the thickness does not exceed 100 miles. As they reflect the light of the sun, the rings and moons, as seen from the planet, must present a grand spectacle. **Uranus** is 1,780 millions of miles distant from the sun, and is visible to the naked eye as a faint star. **Neptune** is the most distant planet.

In addition to the planets there are certain other bodies which revolve around the sun, and which shine by their own light. These bodies are called **comets**. They have excited the greatest interest throughout all ages, by their sudden appearance, their great brilliancy, and enormous size. It is said that they are as numerous in the heavens as fish in the ocean. Comets shine chiefly by reflected sunlight, though some comets approach the sun so closely that they become sufficiently heated to shine by their own light also. The tail of the comet seen in 1843 was 112,000,000 miles in length.

Thousands of small fragments of matter, possibly the debris of disintegrated comets, revolve around the sun. Many of them enter our atmosphere, in which case the friction of the air on the rushing fragment develops enough heat to render it luminous as a **meteor** or falling star. They are generally entirely consumed in the air, but sometimes a remnant of one reaches the earth's surface as a mass of stone and metal called an **aërolite**. In no case have they yet revealed the existence of any element not found on the earth.

The **moon** is about 240,000 miles distant from the earth, and is a comparatively small body, being only a little more than 2,000 miles in diameter. It would require 49 moons to make one earth. The moon revolves around the earth from west to east (not east to west) in $27\frac{1}{3}$ days. As a result of the inferior size and mass of the moon, gravity (or weight) on its sur-



face is only about one-sixth what it is on the earth. Thus, if there were inhabitants on the moon, they could lift six pounds as easily as we lift one, and would be able to toss about rocks and boulders as if they were bits of cork. The moon always keeps the same side presented to the earth. She turns once on her own axis in the same time that she takes to go round the earth. Nothing has yet been seen on its surface which would indicate life in any form. However we may account for its present condition, there is no doubt that the moon as a world has lived its life and is now dead, and remains in our heavens as a beacon to point to us the inevitable destiny of our own world, which, by reason of greater strength, is still living, but which must in its turn also decay and pass away.

The **nebulae** are objects of the most stupendous proportions. They resemble great cloud patches of light. Were our earth and thousands and millions of bodies quite as big all put together, they would not be nearly so great as one of these nebulae. A cluster of stars viewed in a small telescope will often look like a nebula, for the rays of the stars become blended together. A powerful telescope will, however, reveal the separate stars. Of all the nebulae, there are but **two** which can be seen **without a telescope** — the nebula in the Andromeda and the Orion nebula. Mr. Lockyer regards nebulae as consisting of swarms of meteorites at a low temperature, the light proceeding from the glow of the gases between the meteoric particles.

A luminous belt, called the **galaxy** or **milky way**, surrounds the heavens, nearly in a great circle, so as to divide the sky into two portions almost equal. It is seen in the telescope to be mainly composed of small stars. It also contains a large number of **star clusters**.

Scientists conclude that **space cannot be empty**, but what the exact nature of this all-pervading ether is, they cannot at present tell. Every star which shines in the heavens bears unmistakable evidence of its existence.

Session IN Spelling

INTRODUCTORY NOTE.

The difficulty of spelling—a difficulty which is felt even by able and well-educated persons—arises from the fact that the English language has never been in possession of one fixed and uniform manner of writing down the sounds of which it is composed. There are, for instance, thirteen different vowel sounds, with more than one hundred ways of representing them to the eye. There is really no remedy for bad spelling except that found in hard work and accurate observation. If you are a “bad speller,” you will learn most rapidly by *sight*—by noticing words in your reading and by an abundance of writing. **Don't waste time** learning to spell words which you are unable to use correctly in your composition or correspondence.

IMPORTANT CAUTIONS.

Words of like sound.—*Aisle*, passage way; *altar*, of a church, *alter*, to change; *bare*, uncovered, *bear*, an animal, to carry; *beach*, sea-shore; *berth*, sleeping-place; *board*, lumber, meals; *bridal*, relating to a wedding; *canvass*, to solicit; *cellar*, an underground room; *cereal*, grain, *serial*, a continued story; *choir*, singers, *quire*, of paper; *coarse*, not fine, *course*, of study, race course; *council*, an assembly, *counsel*, advice; *fair*, beautiful, an exhibition, *fare*, food, cost of transportation; *gait*, manner of walking, *gate*, an entrance; *hair*, of the head; *heal*, to cure, *heel*, of the foot; *here*, in this place, *hear*, to perceive by the ear; *whole*, complete; *knew*, did know; *loan*, something lent, *lone*, lonely; *mail*, letters; *mantel*, a shelf, *mantle*, a cloak; *pail*, a vessel, *pale*, white; *pair*, a couple, *pare*, to cut off, *pear*, fruit; *peace*, rest, *piece*, a part; *principal*, chief, *principle*, rule; *right*, correct. just, *write*, to form words, *rite*, a ceremony; *route*, a line of travel; *sail*, of a ship, *sale*, the operation of selling; *soar*, to rise high, *sore*, painful; *stake*, an upright stick; *steak*, a slice of meat; *stationery*, writing material, etc.; *their*, belonging to them, *there*, in that place; *to*, towards, *too*, overmuch, *two*, one and one; *weak*, feeble, *week*, seven days.

Words that may be confounded.—Better look these up in your dictionary: accept, except; affect (to influence), effect (to accomplish); allusion, illusion; collision, collusion; critic, critique;

dairy, diary; de cease, disease; elicit, illicit; eminent, imminent; exaltation, exultation; human, humane; insight, incite; ordinance, ordnance; perspective, prospective; precede, proceed; sanatory, sanitary; statue, statute; suit, suite.

CONTRASTED ENDINGS.

ay, ey — affray, array, convey, survey, obey.
ade, aide — arcade, lemonade, persuade, afraid.
ale, ail — female, inhale, scale, assail, curtain, frail.
ame, aim — became, inflame, claim, proclaim.
ane, ain — insane, profane, abstain, domain, refrain.
aign, eign — arraign, campaign, feign, reign.
are, air — beware, declare, affair, despair, stair.
aze, ase — amaze, craze, glaze, phase, phrase.
el, ell — compel, excel, propel, farewell, knell.
ense, ence — condense, expense, commence.
ede, eed — accede, intercede, precede, exceed.
eme, eam — extreme, supreme, scheme, esteem.
ene, een — convene, intervene, canteen, scene.
ine, ean — chlorine, gelatine, machine, clean.
ere, eer — interfere, persevere, career, domineer.
ear, ier — appear, arrear, cashier, financier.
ease, eace — cease, decrease, grease, increase,
 peace.
ete, eet — athlete, compete, secrete, discreet.
eat, eit — defeat, entreat, conceit, deceit.
ieve, eive — achieve, believe, thief, deceive.
ise, ice — concise, paradise, advice, twice.
age, ege — average, marriage, privilege, college.
al — carnival, criminal, disposal, final, legal, rival.
el — angel, cancel, chisel, gospel, parcel, travel.
le — angle, candle, couple, disciple, gentle, trouble.
able — abominable, acceptable, admirable.
ible — audible, contemptible, eligible, responsible.
cal, cle — critical, medical, miracle, obstacle.
cial, tial — beneficial, provincial, essential, partial.
ine, ain — determine, famine, imagine, certain.
ian, ion — civilian, guardian, historian, champion.
cian, sion — electrician, politician, excursion.
ar, er — beggar, circular, pillar, prisoner, milliner.
or, re — author, bachelor, lustre, massacre.
cious, tious — atrocious, cautious, ambitious.
ance — acceptance, ambulance, balance, grievance.
ence — audience, condolence, conference.
ant — abundant, assailant, assistant, defendant.
ent — apparent, competent, correspondent.
cy, sy — agency, delicacy, juicy, leprosy, gypsy.
ary — arbitrary, boundary, customary, honorary.
ery — artillery, celery, cemetery, gallery, machinery.
city, sity — audacity, capacity, adversity, curiosity.

TEN GOOD SPELLING RULES.

Note. — Exceptions are in brackets.

1. **An accent on a single final consonant doubles it.** Bar, barring; chat, chatting, drum, drummer; clan, clannish; plot, plotting; compel, compelling; permit, permitted; refer, referred; (gas).

2. **An unaccented final consonant is not doubled.** Bigot, bigoted; benefit, benefited; develop, developed; (worship).

3. **A single l is doubled before a vowel-suffix.** Cancel, cancelled; duel, duelling; label, labelled; (parallel).

4. **Final e is dropped before a vowel.** Blame, blamable; excite, excitable; move, movable; value, valuable; (words ending in *ce* and *ge*, as change, changeable. (Words ending in *ee*, *oe*, *ye*, retain the *e* before *ing*, as shoe, shoeing.)

5. **Words ending in ey, oy, or ay add s for plural.** Alleys, chimneys, moneys, journeys, turkeys.

6. **Double l loses one l when compounded.** Dull, dulness; fill, fulfil; full, skilful; roll, enrol; wilful. (Several exceptions, such as farewell, downfall, illness.)

7. **Write ie, if pronounced e, except after c.** Believe, brief, grief, mischief, ceiling, conceit, perceive, thief, relieve, yield.

8. **The prefixes dis and mis are never diss and miss.** Disband, disinherit, dissuade, misbehave, misinform.

9. **Adjectives ending in ble make nouns in bility.** Amiable, amiability; possible, possibility; liable, liability.

10. **Adjectives ending in ate make nouns in acy.** Accurate, accuracy; delicate, delicacy; obstinate, obstinacy.

TWO HUNDRED DIFFICULT WORDS.

Abridgment, accumulate, acquiesce, address, admissible, aeronaut, affability, aggravate, agreeable, amanuensis, ambassador, anonymous, apostasy, appalling, armament, artificial, assassin, atheism, aviary, bankruptcy, bargain, barometer, barricade, bazaar, believe, business, bouquet, bronchitis, cabinet, calendar, cancelled, capability, caricature, catarrh, celery, chieftain, cigarette, civilian, cocoa, collateral, commodious, conceit, confectionery, corduroy, counterfeit, curriculum, customary, deceive, deferred, delicacy, descendant, Wednesday, February, domain, dysentery, ecstasy, eligibility, embarrassment, envelope, equally, exceed, exhilarate, extravagance, facilitate, forfeit, fraudulent, frontispiece, gaiety, garrison, gazetteer, giraffe, gorgeous, granary, grenadier, grievance, guarantee, guinea, hackneyed, hammock, heifer, hereditary, honorary, icicle, idolatrous, illiterate, impossible, inaugurate, incendiary, incomparable, incurred, indictment, influenza, initiatory, insatiable, intricacy, itinerant, janitor, judgment, kerchief, laboratory, languor, laudatory, lavatory, leisure, levelled, librarian, liniment, liquorice, longevity, luncheon, luscious, mackerel, mahogany, maintenance, manœuvre, mantlepiece, marriageable, massacre, meerschaum, menacing, menagerie, mercenary, meteor, millennium, mimicking, miniature, missionary, molasses, monotonous, moustache, musician, nauseous, necessarily, nonpareil, nuisance, obsequies, offertory, optician, pageant, palatable, panacea, parachute, parallel, paralysis, parliament, patrolling, pavilion, peasantry, penitentiary, permissible, petroleum, phaeton, physician, plaintiff, plebeian, pleurisy, porcelain, poultice, prairie, preliminary, preparatory, privilege, progenitor, promissory, psychology, pulley, purvey, quarrelling, query, rarity, receipt, reciprocity, regatta, release, removable, repressible, reservoir, restaurant, rhyme, salary, saleable, saucily, sciatica, scythe, secession, separate, shyly, souvenir, squalor, stereotype, stratagem, suicide, surfeit, surgeon, symphony, trousseau, valise, veterinary, victuals, yacht.

COMMERCIAL ARITHMETIC

INTRODUCTORY NOTE.

The author of this book gives instruction by mail to a large number of men and women each year, and he knows something of the needs of those who are anxious to improve their time by home-study. In the preparation of these few brief lessons, care has been taken to present the every-day business side of arithmetic. Fully two-thirds of the arithmetic taught in the public and high schools of this country is nothing more than finger exercise, and so far as actual benefit is concerned the children might much better be darning stockings. To do an exercise which has no practical value and which does not produce any mental growth is, to say the least, to spend time foolishly. The boy who fails to solve a problem after spending an hour's hard labor on it, gets one thousand times the benefit from the exercise that the boy gets who solves the problem correctly in a minute. It is the effort which we make, not what we accomplish, which counts in the educational world.

UNITED STATES MONEY.

Gold Coins. The gold coins of the United States are as follows: Twenty Dollars (Double Eagle); Ten Dollars (Eagle); Five Dollars (Half Eagle); Three Dollars; Two and One-half Dollars; One Dollar. The weight of a \$10 gold piece is 258 Troy grains. The weights of the other coins are in the same proportion to their value. All are made of *nine-tenths* pure gold. Gold coins of standard weight are legal tender for all debts.

Silver Coins. The silver coins are as follows: One Dollar; Half-Dollar; Quarter-Dollar; and Dime. The Dollar weighs 412.5 Troy grains, and the Half-Dollar weighs 192.9 Troy grains. The Five-cent piece and the Three-cent piece are made of three parts copper and one part nickel. The one-cent piece is made wholly of bronze.

Silver Certificates. Any holder of silver dollars, to the amount of ten dollars or more, may deposit the same with the Treasurer of the United States and obtain therefor *Silver Certificates*, which are receivable for duties, taxes and all public debts. Smaller silver coins to the amount of twenty dollars will be similarly exchanged.

Treasury Notes. Treasury Notes, or Greenbacks, are the same denominations as the bills of the National Banks, with the addition of \$5,000 and \$10,000 value respectively. They are legal tender for all debts except customs duties and interest on the public debt, and are usually receivable for these also, being convertible into coin on demand when presented in sums of fifty dollars or more.

National Bank Bills. These are issued by National Banks under the supervision of the Government. The denominations are \$1, \$2, \$5, \$10, \$20, \$50, \$100, \$500, and \$1,000. They are secured by deposits of Government Bonds with the United States Treasurer. They are usually received for all debts, but strictly speaking are not legal tender.

PRACTICAL EXERCISES.

1. You receive a somewhat worn \$10 gold piece. You find that it weighs 213 Troy grains. What is its value?
(Ans. \$8.33.)

2. A book agent bought 90 books at \$2.75 each. He sold them at \$5 each. His expenses were \$12.25. He was unable to collect for three books. How much did he gain or lose?
(G. \$175.25.)

3. A ton of coal lasts a family 14 days. If coal is worth \$5.25 a ton, what will their coal cost from Oct. 1st of one year until March 31 of the next?
(Ans. \$68.25.)

4. A merchant's cash receipts for a week are \$231.14, \$125.63, \$632.84, \$321.15, \$424.17 and \$563.85. Find his daily average.
(Ans. \$383.13.)

5. If 5 shillings be worth \$1.22, how much should one receive for an English P. O. money order for £24 11s. 6d.?
(Ans. \$119.93.)

GAINS AND LOSSES.

The difference between the cost of anything and the price at which it is sold is a **gain** or **loss** — a gain when the selling price is the greater, and a loss when the cost is the greater. Almost the entire business of the country is conducted for the purpose of profit, and for this reason commercial arithmetic is made up largely of computations of gains and losses. Try the five examples given below:

PRACTICAL EXERCISES.

6. A milk dealer buys 27 ten-gallon cans of milk each day at \$1.75 a can. He keeps three delivery wagons at an expense of \$1.75 a day, and sells milk at 7 cents a quart. Find his gain in ten weeks including Sunday.
(Ans. \$1,617.)

7. A man bought a house and lot for \$7,842. He built an addition to the house at a cost of \$1,643. The house was destroyed by fire, and he received insurance \$3,520. He then sold the lot for \$5,212. How much did he lose?
(Ans. \$750.)

8. A merchant had goods on hand at the first of the year valued at \$12,324. He bought goods at a cost of

\$7,623, and sold goods for \$14,265 during the year. At the end of the year his stock book shows goods on hand worth \$8,937. How much did he gain during the year?
(Ans. \$3,255.)

9. A grocer bought 100 loads of potatoes, of 30 bushels each, at $37\frac{1}{2}$ cents a bushel. Allowing $7\frac{1}{2}$ bushels for waste, how much will he gain by retailing the remainder at 15 cents a peck?
(Ans. \$670.50.)

HOW TO MAKE CHANGE.

Salesmen usually make change by addition. They have the money to count out, and in doing so, they add to the amount of the purchase until they reach the amount of the bill presented. For example, if you buy something worth \$3.35 and present a ten-dollar bill in payment, you will probably receive in return 5 cents, 10 cents, 50 cents, \$1, and \$5, the salesman saying, 40, 50, \$4, \$5, \$10. This method is least liable to error. Accuracy and rapidity in counting out change can be acquired best by practice behind the counter or at the cash-desk.

PRACTICAL EXERCISES.

10. If you have no change except a 25-cent piece, a 50-cent piece, and a \$5 bill, how can you pay a bill of \$1.65, if the collector has two 10-cent pieces and several \$2 bills?

11. You owe \$4.40, and have a \$10 bill, a silver dollar, and 3 10-cent pieces. The collector has \$7 in bills, three 25-cent pieces, and a 5 cent piece. How can change be made?

HINTS ON DECIMALS.

Many persons who are thoroughly familiar with ordinary fractions, find much difficulty in multiplying or dividing **decimals** correctly. The fraction $\frac{1}{2}$ when written in the form of a decimal is .5. To change a decimal to a fraction write for denominator *one* followed by as many ciphers as there are digits after the decimal point. $.5 = \frac{5}{10} = \frac{1}{2}$. $.2 = \frac{2}{10} = \frac{1}{5}$. $.04 = \frac{4}{100} = \frac{1}{25}$. Remember that .50 is the same as .5. Annexing ciphers to a decimal does not alter its value. $4 \times 4 = 16$. $.4 \times .4 = .16$. $.04 \times .004 = .00016$. There are always as many decimal places in the product as in the multiplier and multiplicand together.

PRACTICAL EXERCISES.

12. Ten times a certain decimal is 3: what is one-tenth of the decimal?
(Ans. .03.)

13. To the difference between 5 and .5 add .05.
(Ans. 4.55.)

14. Multiply .006 by $\frac{1}{2}$ and divide the product by 3.
(Ans. .001.)
15. Find the cost of 3,235 pounds of coal at \$5.25 a ton.
(Ans. \$8.49.)
16. Find the cost of 6,284 feet of lumber at \$12.35 a M.
(Ans. \$77.61.)
17. Find the cost of constructing 5,984 feet of sidewalk at \$137.50 per thousand feet. (Ans. (\$822.80.)

MEASURES.

Measurements are treated under the heading of Mechanics' Arithmetic in another part of this book. **Avoirdupois weight** is used in weighing all articles except precious metals and dry medicines. One ton equals 2,000 pounds. One pound equals 16 ounces. One stone equals 14 pounds. **Liquid measure** is used in measuring liquids. There are 4 gills in a pint, 2 pints in a quart, and 4 quarts in a gallon. There are $31\frac{1}{2}$ gallons in a barrel. **Dry measure** is used in measuring dry articles. There are 8 quarts in a peck, and 4 pecks in a bushel. The United States standard bushel measures 2,150.42 cubic inches. **Time** is measured by seconds, minutes, hours, days, weeks, months, and years. All years divisible by 4, except centennial years, are leap years. All centennial years divisible by 400 are leap years. There are 12 dozen in a **gross**. There are 24 sheets in a **quire**, and 20 quires in a **ream**.

PRACTICAL EXERCISES.

18. How many pints of oil in a vessel containing 15 gallons?
(Ans. 120 pts.)
19. A fruit dealer bought 5 bushels of cherries at \$2.50 a bushel, and sold them at 15 cents a quart. Did he gain or lose, and how much?
(Ans. G. \$11.50.)
20. What is the value of 3,426 bushels of potatoes at 42 cents a peck?
(Ans. \$5,755.68.)
21. A boy bought a gross of penholders for 80 cents and sold them at 3 cents each. Find his profit.
(Ans. \$3.52.)

BILLS AND ACCOUNTS.

A **bill** or an **account** is a detailed statement of merchandise sold, or of services rendered. A person who owes money, goods, or services is called a **debtor**; and the person to whom the money, goods, or services are due, is called a **creditor**. A *bill* should state the names of the buyer and seller the place and time of the transaction, and any special

terms agreed upon by the parties. A *bill* is **receipted** when the words "Received payment," or "Paid," are written at the bottom, and the creditor, or some one acting for him, affixes his name. After an **itemized** bill has been rendered and not paid, the creditor does not usually make out a second bill complete, but simply the form of a bill with the words "To account rendered," and the total amount. This incomplete form is called a **statement**. If goods are sold on credit after an itemized bill of a previous purchase has been rendered, the new items are simply added to the statement.

PRACTICAL EXERCISE.

TRANSACTIONS.

Aug. 20, 1892. Newton, Mass. Guy Mannering bought of Daniel Deronda & Co., on acct., 26 yds. Silk at \$1.45; 4 yds. Lining at 15¢; 4 yds. Muslin at 11¢; 2 doz. Buttons at 25¢; 12 yds. Flannel at 38¢; 2 pr. Kid Gloves at \$1.25; 7 yds. Ribbon at 32¢. *Oct. 15, 1892.* 15 yds. Black Cloth at \$2.10; 5 yds. Tweed at \$1.85. *Nov. 13, 1892.* Guy Mannering pays on account, \$30. *Dec. 15, 1892.* Guy Mannering pays his account in full.

CLERK'S WORK.

Make out and render an itemized bill Aug. 31.
Render a statement on Sept. 30.
Make out the account to be rendered Oct. 31.
Credit this last bill with the amount paid Nov. 13.
Render a statement on Nov. 30.
Receipt this last statement in full Dec. 15.

[ITEMIZED BILL.]

NEWTON, MASS., Aug. 31, 1892.

Mr. Guy Mannering,

To DANIEL DERONDA & Co., Dr.

Accounts rendered monthly.

Aug.	20	26 yds. Silk	@	1.45	37	70		
		4 yds. Lining	@	.15		60		
		4 yds. Muslin	@	.11		44		
		2 doz. Buttons	@	.25		50		
		12 yds. Flannel	@	.38	4	56		
		2 pr. Gloves	@	1.25	2	50		
		7 yds. Ribbon	@	.32	2	24		
					—	—	48	54

[STATEMENT.]

NEWTON, MASS., Sept. 30, 1892.

Mr. Guy Mannering,

To DANIEL DERONDA & Co., Dr.

Accounts rendered monthly.

		To account rendered Aug. 31	48	54
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[STATEMENT AND BILL.]

NEWTON, MASS., Oct. 31, 1892.

Mr. Guy Mannering,

To DANIEL DERONDA & Co., Dr.

Accounts rendered monthly.

		To account rendered Sept. 30 . .			48	54
Oct.	15	15 yds. Blk. Cloth . . . @ \$2.10	31	50		
		5 yds. Tweed @ 1.85	9	25	40	75
					89	29
		Received cash \$30.			=	=
		DANIEL DERONDA & Co.				

[STATEMENT.]

NEWTON, MASS., Nov. 30, 1892.

Mr. Guy Mannering,

To DANIEL DERONDA & Co., Dr.

Accounts rendered monthly.

		To Balance of account	59	29
		<i>Received payment in full,</i>		
		DANIEL DERONDA & Co.,		
		Per JOSH WHITCOMB.		

NOTE.—When a clerk receipts a bill it is customary and necessary to write his own name under that of the creditor.

PERCENTAGE.

The term **percentage** is applied to certain arithmetical exercises in which 100 is used as the basis of computation. **Per cent** (written %) is an abbreviation of the Latin *per centum*, meaning "by the hundred." The **rate** is the number which denotes how many units are taken in each hundred.

PRACTICAL EXERCISES.

23. What fraction of \$200 is \$5? What per cent?
24. A clerk who received \$325 a year had his salary raised 40%. What does he receive now?
(Ans. \$455.)
25. A lawyer collected a debt of \$3,264, and charged 5% for his services. How much did he pay over?
(Ans. \$3,100.80.)
26. Ten years ago the population of a city was 26,276. Its present population is 31,530. Find the increased per cent.
(Ans. 20%.)
27. What per cent above cost must a man mark his goods in order that he may take off 10% from the marked price and still make 20% on the cost?
(Ans. $33\frac{1}{3}\%$.)

TRADE DISCOUNT.

When a reduction is made from the nominal price of an article, from the amount of a debt, or from the face of a note, it is called a **discount**. The **list price** is usually the catalogue price, or the retailer's selling price. The manufacturer or wholesale dealer allows the retailer a **trade discount** which is deducted at a certain rate per cent from the face of the invoice. The amount of the discount depends sometimes upon the amount of the order, and sometimes upon the terms of settlement. Very often two or more discounts are deducted in succession. Thus 10% and 5% off, or, as it is generally expressed in business, 10 and 5 off, means a discount of 10%, and then 5% from what is left. This is not equivalent to a discount of 15%. The result is not affected by the order in which the discounts are taken.

ILLUSTRATIVE EXAMPLES.

1. Invoice \$80. Dis. 20 and 10 off. Find net amt.

$$\begin{array}{r}
 \$80.00 \\
 16.00 \quad \text{Multiply by 2 and carry one place to the right.} \\
 \hline
 64.00 \\
 6.40 \quad \text{Carry one place to the right.} \\
 \hline
 \$57.60 \quad \text{Ans.}
 \end{array}$$

2. Invoice, \$324.45. Dis. 30 and 5 off. Find net amt.

$$\begin{array}{r}
 \$324.45 \\
 97.335 \\
 \hline
 227.115 \\
 11.355 \\
 \hline
 \$215.76 \text{ Ans.}
 \end{array}$$

Multiply by 3 and carry one place to right.

Take half and carry one place to right.

PRACTICAL EXERCISES.

28. A dealer gives 25 and 10 off. Find the net amount of an invoice of \$420. (*Ans.* \$283.50.)

29. What is the difference of a bill of \$425 between a discount of 50% and a discount of 30% and 20%? (*Ans.* \$25.50.)

30. An agent buys 3 pianos, the list prices of which are \$420, \$630, and \$800. He is allowed 20 and 10 off. He sells the pianos at an advance of 50% on the cost prices. Find his total profit. (*Ans.* \$666.)

INVOICES.

An **Invoice** is a detailed statement of merchandise sold by one dealer to another. Invoices are very different in detail. No rules for the guidance of students can be given. The peculiar methods of any particular business house can be learned only by actual practice in that house.

EXCHANGE.

The system by which merchants in distant places discharge their debts to each other without the transmission of money is called **exchange**. The business of exchange is usually conducted through the medium of drafts forwarded and collected by banks.

COMMISSION.

Commission is an allowance or compensation to an agent or jobber. The business of a **broker** is very similar to that of a commission merchant except that the former does not usually have possession of the merchandise bought or sold. The person who sends goods to be sold is called the **consignor** or shipper. The name **consignment** is given to the goods sent. The commission or brokerage for buying or selling merchandise or real estate is usually estimated at a certain per cent of the amount invested or realized.

PRACTICAL EXERCISES.

31. An estate dealer sells a house and lot for \$5,620 at $2\frac{1}{2}$ per cent. What is his commission? (*Ans.* \$140.50.)

32. A manufacturer sent \$5,202 to a leather dealer with which to purchase leather at $2\frac{1}{2}\%$ commission on the sum invested. How much commission should he deduct?
(*Ans.* \$102.)

TAXES AND DUTIES.

Taxes are sums of money assessed on persons, property, or incomes, to defray the expenses of a country or corporation. A **license** is a written permit to conduct a certain business. **Duties** or customs are taxes levied by the government on goods imported from foreign countries. Some duties are levied according to the weight of the article, and others according to the value.

PRACTICAL EXERCISE.

33. The New York City tax rate for a particular year is quoted as \$18.50. What will be the taxes on a house assessed for \$9,000?
(*Ans.* \$166.50.)

INTEREST.

Interest is the sum charged for the use of money. It is really the use of money, or the benefit derived from its use. The **principal** is the sum for the use of which interest is paid. The **rate** is the per cent of the principal charged for its use for one year. Accurate interest is reckoned on a basis of 365 days to a year. Sixty-day interest is reckoned on a basis of 30 days to a month. In **counting the days** from one date to another include one of the dates given but not both.

ILLUSTRATIVE EXAMPLES.

1. Find the interest on \$240 from Aug. 13 to Dec. 12 at 6%

From Aug. 13 to Dec. 12

$$= 18 + 30 + 31 + 30 + 12 = 121 \text{ ds.}$$

$$(240 \times 6 \times 121) \div (100 \times 365) = \$4.77. \text{ Ans.}$$

2. Find the interest at 5% on a note drawn April 5, at 3 months. Face of note \$146 (allow 3 ds. grace).

From April 5 to July 5 = 3 months.

Note due July 8.

From April 5 to July 8

$$= 25 + 31 + 30 + 8 = 94 \text{ ds.}$$

$$(146 \times 5 \times 94) \div (100 \times 365) = \$1.88. \text{ Ans.}$$

Note.—There are many short methods of computing interest. For explanations of the best of these we refer you to the department of this book devoted to short-cuts in figures.

PRACTICAL EXERCISES.

34. A man borrows \$1,840 at 5% and loans it immediately at $7\frac{1}{2}\%$. What does he gain in nine months?
(*Ans.* \$34.50.)

35. A man pays \$375 a year rent for a house worth \$5,400. Will he gain or lose, and how much in four years, if he borrows money at 7% to purchase the house? (Lose \$12).

36. David Copperfield borrows \$730 from Oliver Twist and gives in return the following promissory note:

*Old Curiosity Shop, Mar. 3, 1892.
Three months after date for value received
I promise to pay to the order of Oliver
Twist the sum of Seven Hundred and
Thirty Dollars with interest at six per
cent.
David Copperfield.*

David Copperfield cannot pay this note when it falls due. He therefore (on the third day of grace) gives Oliver Twist a new note for the full amount including the interest then due. The following is the second note with the date and exact amount omitted:

*Old Curiosity Shop ———, 1892.
Seventy days after date for value received
I promise to pay to the order of Oliver
Twist the sum of Seven Hundred and
——— Dollars with interest at 5 per cent.
David Copperfield.*

What is the full amount (principal and interest) to be paid by Copperfield when the second note falls due? Allow three days of grace in each instance, and reckon accurate interest on a basis of 365 days to the year.

BANK DISCOUNT.

The sum charged by a bank for cashing a note or a time draft is called **bank discount**. This discount is simply the interest, paid in advance, for the number of days the note or draft has to run. In the business world few notes are given for a longer period than four months. When a note is discounted at a bank the payee **indorses** it, making it payable to the bank. Both maker and payee are then responsible to the bank for its payment. If the note is drawing interest the discount will be reckoned on and deducted from the amount due at maturity.

INSURANCE.

Insurance is the indemnity secured against possible loss or damage. The **policy** is the contract or agreement between the insurer and the insured. The **premium** is the sum paid for insurance, and is usually a certain percentage of the amount insured. The rate depends upon the character and location of the property.



1. THE LEGISLATIVE DEPARTMENT.

Congress. All legislative powers of the United States are vested in a Congress consisting of a Senate and a House of Representatives. Congress assembles at least once a year.

Representatives. The House of Representatives shall be composed of members chosen every second year by the people of the several States. A Representative must be not younger than 25 years, and have been a citizen seven years. One Representative is allowed for each 30,000 inhabitants. The House of Representatives choose their Speaker and other officers. The Speaker appoints the committees, and these really determine what the House shall do.

Senate. The Senate is composed of two Senators from each State, chosen by the legislature thereof, for six years. A Senator must be not younger than 30 years, and have been a citizen nine years. The Senators represent the States; the Representatives represent the people. Both are expected to vote according to their own individual opinion. The Vice-President of the United States is president of the Senate.

Laws. In order to become a law a bill must pass both houses and receive the signature of the President. If the President withholds his signature, or, in other words, vetoes the measure, it is returned to the house, and can become law only by a two-thirds vote of the members of each house. A bill may originate in either house, except it be a bill relating to the raising of revenue. In that case it must originate in the House of Representatives.

2. THE EXECUTIVE DEPARTMENT.

President. The executive power is vested in a President who holds office for four years. He must be a "natural born citizen" and be at least 35 years old.

He is commander-in-chief of army and navy and has the vast majority of important executive appointments under his control. He regulates all foreign relations. The election of the President is indirect, through electors chosen by the people. The electors of a State equal in number its total representation in Congress. The election is held on the Tuesday following the first Monday in November, every four years. The party conventions held earlier in the year are by far the most important part of the machinery of the election. The Vice-President is chosen at the same time and in the same manner as the President. He has no part in the executive function.

Cabinet. The heads of the leading departments, known as Secretary of State, Secretary of War, Secretary of the Navy, Postmaster-General, etc., form what is known as the President's Cabinet.

3. THE JUDICIARY DEPARTMENT.

Judiciary. The Judiciary of the United States consists of a Supreme Court, Circuit Courts and District Courts. Its organization and functions rest more upon constitutional provision than upon statute. The Supreme Court consists of a chief justice and eight associate justices. These control subordinate courts called Circuit Courts. Each circuit is divided into districts in which are held District Courts. All judges of the United States Courts are appointed by the President, with and by the consent and advice of the Senate, to serve during good behavior. Almost every district has its own federal district attorney and its own United States marshal, both of whom are appointed by the President. If a ship rescued the cargo of another ship, and questions arose between the two owners, such a case would come before the United States Court. If a question arose about a railroad which crossed several States, it might come before a United States judge. So with suits about patents upon inventions and the copyright of books. If a question arose under any act or law of Congress; or between citizens of different States; in such cases the national courts may be asked to decide.



HINTS FOR SALESMEN.

Frankness invites frankness.

Cultivate a memory for faces and names.

Selling ability depends very largely on common sense.

It is not the quantity but the quality of speech that tells.

The seller should only talk enough to keep the buyer talking.

Christian principles and morality are best illustrated by example.

Never show the white feather. Nothing succeeds like success.

By presenting many samples at once you will confuse the buyer.

If there be any grand secret, it will be found somewhere in that vital quality called force of character.

It stands to reason that a salesman will succeed best with a line of goods for which he has a natural liking.

If a salesman cannot bring himself to believe in himself, his house and his goods, he is either very badly placed, or he has mistaken his calling.

Remember that there is often less difference between two men, than between two moments of the same man.

A conceited, pretentious and affected manner disgusts and repels, while a person whose bearing is simple and natural, attracts and makes friends.

Remember that he who puts another in the attitude of being a teacher to him pays a delicate compliment which is generally appreciated.

The eye is the chief medium through which a man fires off whatever personal magnetism he possesses.

One who really feels good-will may often infuse it into the heart of another by looking kindly and pleasantly straight into his eyes.

There is an old maxim: "When you buy, keep one eye on the goods, the other on the seller; when you sell, keep both eyes on the buyer."

The best salesmen of the future will not be illiterate. Education informs the mind, trains the thinking powers, and stamps the face with intelligence.

Activity is not necessarily energy or industry.

A Westerner says that it does not matter what kind of tracks you leave so long as you get there. This is certainly not true when applied to salesmen.

There are cold, bilious, disgruntled people, who can no more be opened out by politeness than oysters. Such can only be reached through their self-interest.

The well-dressed man has more self-respect, and commands more than the man in seedy attire.

The successful man is a man who knows how to talk, what to talk about, and more especially when to stop talking.

The faculty of holding trade, or of selling repeatedly to the same houses, is the highest attribute in the condition of a successful salesman.

You must be thoroughly informed as to the quality of the goods you are selling.

You will sell more goods in five minutes on a bright, busy day, when the store is full of customers, than in an hour on a rainy day, when everything is dull and the merchant gloomy.

Faithfulness and trustworthiness are more valuable than intelligence, for they are very much harder to find and can't be bought. You can't frighten common-sense into anybody, or bulldoze trustworthiness out of him.

Your associates should be pure and good, and your personal habits correct. You must be governed by sound principles of morality and religion, without which no true success can be attained.

How to conduct a home Reading Club

A **winter reading circle**, if conducted with zeal and enthusiasm, cannot fail to have an elevating influence not only upon those immediately connected therewith, but upon the general literary and educational spirit of the community.

Ask twelve others to join you and form a **Thirteen Club**, continuing your reading and your weekly gatherings for **thirteen weeks**. Get together for organization fully two weeks in advance of your first regular meeting. You will need only **two officers**, a President and a Secretary-Treasurer. Appoint these by ballot at your first meeting. The President will be the general head of the club, while the Secretary-Treasurer will attend to its correspondence and finances.

Arrange an **outline of reading** and study for the thirteen weeks similar to the following :

1. THE ENGLISH LANGUAGE.
2. WILLIAM SHAKESPEARE.
3. THE LAKE POETS.
4. AMERICAN HUMORISTS.
5. CURRENT MAGAZINES.
6. HENRY W. LONGFELLOW.
7. CHARLES DICKENS.
8. TENNYSON.
9. AMERICAN NOVELISTS.
10. OUR FAVORITE POEMS.
11. OUR FAVORITE NOVELS.
12. EMERSON, HOLMES AND LOWELL.
13. LITERARY QUESTION BOX.

Appoint a committee to arrange **thirteen sub-topics** upon each general topic. For example, the

evening devoted to William Shakespeare might be arranged in thirteen departments as follows :

1. EARLY ENGLISH DRAMA.
2. BIOGRAPHY.
3. INFLUENCE OF THE DRAMA.
4. FAMOUS CHARACTERS.
5. SHAKESPEARE'S INFLUENCE ON LITERATURE.
6. FAMOUS SPEECHES.
7. FAMOUS QUOTATIONS.
8. SHAKESPEARE AS A POET.
9. FAMOUS GERMAN DRAMATISTS.
10. HIS GREATEST PLAYS.
11. SHAKESPEARIAN ACTORS.
12. FAMOUS PLOTS.
13. QUESTION BOX.

The subjects may be distributed by **lot**. The member securing No. 13 should prepare **twelve questions** — one for each of the other members. Not more than **ten minutes** should be allowed each member, making the evening meeting about two hours. The members should endeavor to make the exercises as bright and original as possible, and should not under any circumstances confine themselves simply to essay reading. For instance, the member who prepares the sketch of Shakespeare's life should bring portraits, pictures of his home, copies of his autograph, and such other things of interest as may be available.

Members should take turns in presiding, and in every way all members should have the same amount of responsibility, study, and interest. A **membership fee** of one dollar should be charged to meet the expenses of the club.

NOTE. — The author of this book will mail promptly to any address a neatly prepared type-written copy of rules and regulations for a Thirteen Club, including twenty-five subjects from which to select, each fully outlined with sub-departments, hints regarding books, sample questions, and all necessary information, for five dollars. Address: **Seymour Eaton, 42 Hollis St., Newton, Mass.**



INTRODUCTION.

The "want" advertisement calls for a young man who is a "ready penman and quick at figures." These are necessary qualifications. Every person has more or less to do with figures, and any rule likely to lessen labor or make the result more certain should be received with favor. The rules presented in this chapter are the best of which the author has any knowledge.

1. HOW TO ADD RAPIDLY.

Write the numbers in vertical lines. Where a number is repeated several times, multiply instead of adding. In adding horizontally, begin at the left, since the eye is more accustomed to moving from right to left than left to right. Think of results and not of numbers themselves. Thus, do not say 3 and 4 are 7, and 8 are 15, and 9 are 24, etc.; but 7, 15, 24, etc. Make combinations of 10, or other numbers, as often as possible, and add them as single numbers. Thus in adding

$$5 + \overline{4} + \overline{3} + \overline{8} + \overline{2} + \overline{3} + \overline{1} + \overline{4} + \overline{9} + \overline{4} + \overline{5} + \overline{1} + \overline{6}$$

say, 5, 12, 22, 30, 39, 48, 55, taking each group at a glance as a single number. After sufficient experience the mind grasps the figures almost unconsciously, and the result is reached as quickly as the eye can glance along the line with attention. Practice a half hour each day, and in a month the result will astonish you.

2. THE CASHIER'S METHOD.

This rule is applicable to any kind of exercise. We add each column separately, putting down the sum to the right.

\$2354.21	
362.45	
1598.46	
9328.75	
4859.82	
8621.31	
\$27125.00	
	20 28 32 29 28 24
	\$27125.00

For instance, the sum of the numbers in the first column is 20, in the second 28, in the third 32, and so on.

This method is of special value to bank clerks and others who may be disturbed while adding very large amounts. It does away entirely with the process of carrying.

3. THE CASH BOY'S FRACTIONS.

Suppose it is necessary to find the sum of $\frac{1}{4}$ and $\frac{1}{5}$, or any other two fractions with *ones* for numerators. To

$$\begin{array}{r} 4 + 5 = 9 \\ 4 \times 5 = 20 \end{array}$$

find these sums add the denominators, 4 and 5, for the numerator of the answer, and multiply them for the denominator. To subtract them, subtract the denominators for the numerator of the answer, and multiply them for the denominator. This rule applies to all similar fractions, and is well worth remembering.

4. THE LIGHTNING CALCULATOR'S RULE.

The best expert cannot add a column of *ones* any faster than you can. It may be worth your while to study this secret. Teachers find it very helpful when they are obliged to give long addition exercises to the children and wish to be saved the labor of addition

324532
675468
253361
746639
123445
876555
123213
234025
3357238

themselves. Note that the second line added to the first makes *nines*, except at the right, where two figures add to *ten*. The third and fourth, and fifth and sixth lines of figures are similar. The two last rows are small numbers written down at random. Now, to get the answer, begin to the left if you wish. Write down 3, which is the number of "couplets" of figures above, then add only the two rows at the bottom, saying (mentally) 2 and 1 are 3, 3 and 2

are 5, 4 and 3 are 7, 0 and 2 are 2, 2 and 1 are 3, and 5 and 3 are 8. This exercise can be varied greatly by writing the two, or three or four lines at the bottom, or by placing one of these lines at the top and one at the bottom.

5. THE EXCESS RULE.

If you wish to multiply any two numbers, each of which is a little larger than 100, you will find this rule very helpful: Multiply the excesses—

123
104
12792

that is, 23 by 4—and put down the product 92, two places to the right as in the illustration. Then add the two numbers, 104 and 123, omitting one of the *ones* at

the left. Carry when necessary. Apply this rule to any similar numbers such as 112 by 106, or 122 by 105, or 135 by 103.

6. HOW TO PROVE ADDITION IN A MINUTE.

This is an old rule in a new dress. It is certainly a novel and practical method of proving addition. It is really a modification of the old method of casting out the *nines*, which is familiar to every one.

$$\begin{array}{r}
 324632 = 20 = 2 \\
 256398 = 33 = 6 \\
 546312 = 21 = 3 \\
 856659 = 39 = 12 = 3 \\
 725733 = 27 = 9 \\
 334694 = 29 = 11 = 2 \\
 446859 = 36 = 9 \\
 \hline
 3491287 = 34 = 7
 \end{array}
 \left. \begin{array}{l} \\ \\ \\ \\ \\ \\ \\ \end{array} \right\} = 34 = 7$$

Add the figures in each line. The first adds to 20 and their sum is 2. The second adds to 33 and their sum is 6. The third adds to 21 and their sum is 3. The fourth adds to 39 and their sum is 3, and so on. In each case keep on adding until you have reduced the line to one figure. Now find the sum of all these *unitates*. You will get 34, and the sum of 3 and 4 is 7. In this way you reduce the whole example to a *unit*. Now do the same with your answer, and if your addition is correct the *unitate* in each case will be the same. Note this example:

$$\begin{array}{r}
 8943 = 24 = 6 \\
 2586 = 21 = 3 \\
 3472 = 16 = 7 \\
 5963 = 23 = 5 \\
 3485 = 20 = 2 \\
 2157 = 15 = 6 \\
 \hline
 26606 = 20 = 2
 \end{array}
 \left. \begin{array}{l} \\ \\ \\ \\ \\ \end{array} \right\} = 29 = 11 = 2$$

Very little practice will make it unnecessary to write down the *unitates*. They can easily be added as obtained.

7. THE COMPLEMENT RULE.

We have already learned how to multiply two numbers each of which is a little greater than 100. Now take two numbers each of which is a little less than 100, 98 by 94 for instance. The *complement* of a number is the difference

$$\begin{array}{r}
 98 - - 2 \text{ (Complement)} \\
 94 - - 6 \text{ (Complement)} \\
 \hline
 9212
 \end{array}$$

between the number and the unit of the next higher order. Thus the complement of 98 is 2; of 94 is 6; of 987 is 13, etc. To multiply these two numbers multiply the complements, 2 and 6,

and place the product, 12, in the answer. For the remaining two figures subtract across, either the 2 from the 94, leaving 92, or the 6 from 98, leaving 92. Apply this rule to as many exercises as you wish. Try the following: 97×98 ; 99×96 ; 94×89 .

8. THE NINE-NINE-NINE RULE.

This is really Rule No. 7 applied to larger numbers. Suppose you wish to multiply 895 by 994. As in Rule No. 7, write the complements to the right. Now multiply 105 by 6 and place the three figures in the product. Then to get the remainder of the product subtract either the 105 from the 994, or the 6 from the 895.

$$\begin{array}{r} 895 - - 105 \\ 994 - - 6 \\ \hline 889630 \end{array}$$

The 889 might be got by addition. If you add 895 and 994, you will notice that the first two figures, 5 and 4, give the 9, then 9 and 9 are 18, put down 8 and carry *one*, then 1 and 9 and 8 are 18, put down 8 and drop the *one* entirely. This is perhaps easier than subtracting.

9. THE SALESMAN'S RULE.

Suppose you want to find the value of 128 yds. at 75 cents. Now to find the value of any number of yards of cloth at 75 cents a yard, or any number of articles at 75 cents each, deduct one-quarter of the number from itself and call the remainder dollars. At one dollar a yard the answer would be \$128; then at 75 cents it must be three-quarters of this, or one-quarter less. At $87\frac{1}{2}$ cents deduct one-eighth. At $66\frac{2}{3}$ cents deduct one-third.

$$\begin{array}{r} 128 \\ 32 \\ \hline \$96 \end{array}$$

10. THE LOCK-STITCH RULE.

If you wish to multiply any number by 11, you will find this rule very helpful. For instance, if you wish to multiply 23 by 11, you simply add the 2 and 3 together and place the sum between the two original figures. To multiply 362,753 by 11. Put down the right-hand figure, 3. Then say, 3 and 5 are 8. Then, 5 and 7 are 12, put down 2 and carry 1. Then, 1 and 7 and 6 are 14, put down 4 and carry 1. Then, 1 and 6 and 2 are 9. Then, 2 and 3 are 5. Then write the left-hand figure, 3. This is a very simple method. Try a few exercises, first working them the long way, then by applying this *short-cut*.

$$23 \times 11 = 253$$

$$3\ 5\ 9\ 4\ 2\ 8\ 3$$

11. THE LOWELL RULE. NO. 1.

To multiply any two numbers of two figures each, when the right-hand figures add to 10 and the left-hand figures are the same: For instance, 76 by 74. Multiply the two right-hand figures, 6 by 4, placing 24 in the product, then carry 1, and multiply 7 by 8, placing 56 in the product. Always carry *one* adding it to one of the left-hand figures. Apply this rule to any similar numbers, such as 24 by 26, 35 by 35, 27 by 23, 81 by 89, 42 by 48.

$$\begin{array}{r} 76 \\ 74 \\ \hline 5624 \end{array}$$

12. THE LOWELL RULE. NO. 2.

The rule explained in No. 11 can be applied to large numbers. Take for example, 298 by 292. Here the left-hand numbers (29) are the same, and the right-hand numbers add to 10. Say twice 8 are 16, and put down both figures. Then carry *one* to 29, and you have 30. Now, it is quite easy to multiply 29 by 30 mentally. The product is 870, all of which is placed in the answer. Apply this rule to 104 by 106, 112 by 118, 152 by 158, 127 by 123, 993 by 997.

$$\begin{array}{r} 298 \\ 292 \\ \hline 87016 \end{array}$$

13. THE SQUARE RULE.

To multiply numbers such as 37 by 43. Here the mean number — that is, the number which is as much greater than 37 as it is less than 43 — is 40. Forty, squared, or multiplied by itself, gives 1,600. The square of 3, the difference between the mean number and one of the numbers, is 9. $1,600 - 9 = 1,591$ = the product of 37 and 43. Apply this rule to 87 by 73, 63 by 57, 22 by 18, 1,009 by 991, 116 by 124. The entire work should be done mentally.

$$\begin{array}{r} 40 \\ 40 \\ \hline 1600 \\ 9 \\ \hline 1591 \end{array}$$

14. RULE NO. 5 EXTENDED.

If you wish to multiply two large numbers, each of which is a little over 1,000, such as 1,235 by 1,003, proceed as in Rule No. 5. Multiply the excesses, that is 235 by 3, carrying the product, 705, three places to the right. Then add the numbers, omitting one of the *ones* at the left. Apply this rule to such numbers as 1,312 by 1,003, 1,199 by 1,005, etc.

$$\begin{array}{r} 1235 \\ 1003 \\ \hline 1238705 \end{array}$$

15. MULTIPLICATION BY SUBTRACTION.

It is easier for most people to subtract than to mul-

tiply. Instead of multiplying by 9, we multiply by 10 and subtract the number from this product.

$$\begin{array}{r} 8435625 \times 9 = 84356250 \\ \quad \quad \quad 8435625 \\ \hline \text{Product,} \quad \quad = 75920625 \end{array}$$

To multiply by 99, add two ciphers and subtract; to multiply by 999, add three ciphers and subtract, etc.

16. FROM AN ENGLISH ARITHMETIC.

To multiply two small numbers, each of which ends in 5, such as 35 and 95, take the product of the 3 and 7, increase this by one-half of the sum of these figures, and prefix the result to 25. Thus:

$$\begin{array}{r} 35 \\ 95 \\ \hline 3325 \end{array} \quad \begin{array}{l} 5 \times 5 = 25 \\ 9 \times 3 = 27, \quad 27 + \frac{1}{2}(9+3) = 33 \end{array}$$

This rule will be found to hold good with any two numbers each of which end with 5. Apply it to such numbers as 45 by 85, 35 by 75, 95 by 45, etc.

17. THE SINGLE LINE RULE.

In multiplying any number by 21, or 31, or 401, or any number of two figures where the last is 1, or of three figures, where the last two figures are 01, a good deal of time can be saved by abbreviating the ordinary process as here illustrated. For instance, suppose we have to multiply 231,423 by 21. Instead of putting down 231,423 with 21 under it, then drawing a line, multiplying by 1, then by 2 or 20, then adding, as is the ordinary custom; all that is necessary is simply to multiply by the 2, placing the product, one figure to the left, and then to add. Try this method, using 31, 51, 61, 91, 201, 3,001 and 901 as multipliers. There is a saving in the above example of eight figures.

$$\begin{array}{r} 231423 \\ 4628460 \\ 4859883 \end{array}$$

18. HOW SOME ACCOUNTANTS ADD.

It is quite common with accountants to put down both figures as in the illustration. The sum of the first column is 26; carrying 2, the sum of the second column is 29; carrying 2, the sum of the third column is 14; carrying 1, the sum of the fourth column is 19, and the total is 19,496. The total is found by taking the 19, and the right-hand figures of the other three partial sums. There is an advantage in this method, if you desire to go back and add a column a second time.

$$\begin{array}{r} 8596 \\ 3438 \\ 5379 \\ 2083 \\ \hline 19496 \end{array} \quad \begin{array}{r} 26 \\ 29 \\ 14 \\ 19 \end{array}$$

19. ENGLISH INVOICES AND AMERICAN MONEY.

Invoices of goods bought in English markets are in pounds, shillings and pence. The money items have, of course, to be changed to our currency. When money is at par value, and for nearly all practical purposes, the following is the best and shortest method of reducing English money to dollars and cents. This rule appeared originally in "The New Arithmetic" by the author of this book. It has since been copied into several text-books.

Begin by reducing the shillings and pence to the decimal of a pound as follows: *Write one-half of the greatest even number of shillings as tenths, and if there be an odd shilling write five-hundredths; reduce the pence to farthings and write their number as thousandths. If the number of farthings is between 12 and 36, add one to the thousandths; if between 36 and 48 add two to the thousandths.*

$$£3\ 14s\ 6d = £3.725$$

Note — Divide 14 by 2 and put down 7; then multiply 6 by 4 and add 1, getting 25.

$$£4\ 15s\ 10d = £4.7\frac{5}{4}2 = £4.792$$

The pound sterling is equal to $\$4.86\frac{2}{3}$. Now 80 is $\frac{1}{5}$ of 400, $6\frac{2}{3}$ is $\frac{1}{12}$ of 80. Then, to multiply by $486\frac{2}{3}$, multiply by 400; divide the product by 5 and place the quotient under; then divide the quotient by 12, and place the second quotient under the first. Add, and the sum will be the same as though the number were multiplied by $4.86\frac{2}{3}$ in the ordinary way.

Find the value of £3.725 in dollars and cents.

$$£3.725 \times 4.86\frac{2}{3} = Ans.$$

£3.725	4	Multiply by 4 for the dollars. Then
		divide this product by 5, which is
5	14.900	equivalent to multiplying £3.725 by
12	2.980	80; then divide 2.98 by 12, which is
	.248	equivalent to multiplying £3.725 by
	\$18.128	$.06\frac{2}{3}$

20. TO MULTIPLY BY 21, 22, 23, ETC.

This rule applies to numbers of two figures each, the first figure of which ends with 2. Multiply each figure in the multiplicand by the unit figure of the multiplier, adding to each separate product double the figure to the right of the one multiplied; add the tens to the last figure doubled. In this example say: Three twos = 6. Three times 3 and 4 (2 doubled) = 13. Three times 4 and 6 and 1 to carry = 19. Three times 2 and 8 and 1 to carry = 15. Three times 3 and 4 and 1 to carry = 14. Three doubled and 1 to carry = 7. Practise this method.

21. ADDING BACKWARDS.

7343213	36
2345678	30
5432456	26
7214382	29
4132094	25
6863213	38
3426340	34
2534538	
39291914	39291914

To add backwards, begin at the left-hand column, and write down the full amount of each column in regular order, bringing each total one place to the right, as in the illustration. Then add

the totals in the ordinary way. A knowledge of this method serves as a ready and reliable proof to the accountant.

MISCELLANEOUS SHORT-CUTS.

22. This same rule applies to **large numbers** such as 127 by 123, or 295 by 295. By adding *one* to 29 you make 30, and it is an easy matter to multiply 29 by 30 mentally.

23. You can extend the **multiplication table** to the *'teens* by the following rule: To one of the numbers add the units figure of the other and affix a cipher; increase this result by the product of the two units figures, and this will give the product required.

24. You can **prove multiplication** by the method given on page 55 for the proof of addition. Find the *unitate* of the multiplicand and multiply this by the *unitate* of the multiplier. The product should equal the *unitate* of your product.

25. The **six per cent method of interest** is very simple. It is sometimes called the 60-day method. To find the interest of \$248 at 6% for 60 days, you simply cut off two figures and you have the answer, \$2.48. For 30 days the interest is \$1.24. Then multiply by the number of months necessary. For 3 days grace you would add one-tenth, or 12 c. For 7% add one-sixth. For 5% deduct one-sixth; and so on.

26. Here is an **interest rule** which is popular with some book-keepers: Multiply the principal by the time reduced to days; then divide this product by the quotient obtained by dividing 360 by the per cent of interest.

27. Here is **another method**: Reduce the time to months, and to the number thus obtained annex

one-third of the days, which whole number multiplied by one-half of the principal will produce the required interest at 6 per cent.

28. The Detroit rule has some advantages: Multiply the principal, days, and rate together. Suppose this product to be 16,380. Divide by 5 and we get 3,276. Divide this by 4 and we get 819. Divide the first three figures of 3,276 by 5 and we get 65. Now add 3,276, 819, 327, and 65, and we get \$4.487, the interest.

29. There are more **short-cuts** in multiplication than in any other department. If you want to multiply by 427, multiply by 7 and then by 42 which is 6 times the product by 7. This same application can be made in hundreds of numbers such as 927, 279, 728, 287, 729, 14,412, 81,273.

30. Sometimes the multiplier can be separated. For instance, instead of multiplying by 372, multiply by $360 + 12$, that is by 12 first, and then that product by 30.

31. To add $374 + 391 + 265$ in one column, begin by saying (mentally) 374 and $300 = 674$, and $91 = 765$, and $200 = 965$, and $65 = 1,030$.

32. In the **French method**, the divisor is placed on the right of the dividend, and the quotient below the divisor. In the **Italian method** of division, each product is subtracted mentally from its partial dividend, and only the difference written down.

33. Eleven is an exact divisor of
 $10 + 1$, of $100 - 1$, of $1,000 + 1$,
 of $10,000 - 1$, etc.

34. Seven, eleven, and thirteen, and their multiples 77, 91 and 143, are exact divisors of 1,001 and its multiples 2,002, 3,003, 9,009, etc.

35. Every **prime number** when divided by 6, will leave a remainder of 1 or 5. Not every number is prime, however, which leaves these remainders.

36. Every **prime number**, greater than 5, is an exact divisor of any number expressed by as many figures, less 1, and all alike, as there are units in the given prime number. Thus, 7 is an exact divisor of 111,111 or any multiple of it.

37. Much time can be saved in almost any arithmetical exercise involving division by **cancellation**,

that is by rejecting equal or common factors from both divisor and dividend.

38. To add two **fractions** such as $\frac{2}{3}$ and $\frac{3}{4}$, the shortest method is by cross-multiplication. That is, $2 \times 4 = 8$, and $3 \times 3 = 9$; $9 + 8 = 17$ the numerator. Then for denominator multiply the denominators 3 and 4, and you have seventeen twelfths for answer.

39. This same rule applies to **subtraction of fractions**, except that you subtract the products instead of adding them.

40. The following is a **business method** of multiplying mixed numbers: Multiply the integers together, then multiply each integer by the fraction in the other number, to its nearest unit, and add the products.

41. To **square** $5\frac{1}{2}$, that is to multiply it by itself, say 6 times five are 30 and add $\frac{1}{4}$. This rule applies to all similar numbers. To square $16\frac{1}{2}$ say 17 times 15, and add $\frac{1}{4}$.

42. To find the value of **grain** when sold by the bushel: divide the weight by the number of pounds in a bushel, and multiply this by the price.

43. To find the value of **hay** or **coal** when sold by the ton: multiply the weight by the price and take half the product, cutting off three decimal places.

44. To find the area of a **right-angled triangle**, multiply the base by the perpendicular and take half the product.

45. To find the **circumference** of a circle, multiply the diameter by 3.1416.

46. To find the **area of a circle** multiply the square of the diameter by .7854.

47. To find the **area** of the surface of a **globe**, multiply the square of the diameter by 3.1416.

48. To find the **solidity** of a globe, multiply the cube of the diameter by .5236.

49. To find the area of a **cylinder**, multiply the area of the base by the length.

50. To find the **hypotenuse** of a right-angled triangle, find the sum of the squares of the sides and extract the square root.

51. To find the **diagonal of a square**, multiply the side by 10, diminish this by one per cent of itself, and divide the remainder by 7.

52. To find the **amount of lumber** in a log, making proper allowance for waste, from the square of the diameter in inches subtract 60; multiply the remainder by half of the length in feet, and point off the right-hand figure.

53. To reduce logs to **square timber**, multiply the square of the diameter in inches by the length in feet, take one-third of the product, and point off two figures. The result will be cubic feet.

54. To find the amount of **grain in a bin**, take four-fifths of the number of cubic feet.

55. To find the number of **acres** in a rectangular piece of land multiply the length in rods by the breadth in rods, and divide by 160.

56. To find the capacity of a **vat or cistern**, multiply the square of the diameter in feet by the depth in feet and this product by $5\frac{7}{8}$. The result will be in gallons.

57. To find the capacity of a **square tank**, multiply the number of cubic feet by $7\frac{1}{2}$, and you will get the result in gallons.

58. To **square** any number of two figures, square the units, take twice the product of the tens by the units, then square the tens.

59. To **square** any number of **nines**. Begin on the left hand and write as many nines less one, as there are nines in the given number, then write an 8, then as many ciphers as there are nines, then write *one*. Thus the square of 999 is 998,001.

60. Any number is divisible by **three** if the sum of its digits is divisible by three.

61. Any number is divisible by **four** if it ends with two or more ciphers, or if the number expressed by its two right-hand figures is divisible by four.

62. Any number is divisible by **five** if its right-hand figure by five or a cipher.

63. Any number is exactly divisible by 7, 11, and 13, if the units' period and the thousands' period are the same.

64. The product of all the **prime factors** of a number equals that number.

65. The **product** of the greatest common divisor and least common multiple of two numbers equals the product of the two numbers.

66. To multiply any two small numbers each of which end in **one-half**: to the product of the whole numbers, add half their sum, plus $\frac{1}{4}$.

67. When (in Rule 66) the sum is an **odd number** take half the next number below it, and the fraction in the answer will be $\frac{3}{4}$.

68. To multiply any two numbers having the same **fraction**: to the product of the whole numbers, add the product of their sum by the fraction; to this add the product of the fractions.

69. A **square** number multiplied by a square number produces a square number.

70. Any number is divisible by **nine** if the sum of its digits is divisible by nine.

71. To **multiply** any two numbers such as 86 by 84, where the first numbers are the same and the second numbers add to 10 simply say 4 times 6 are 24, carry *one*, and 9 times 8 are 72, putting down 7224 as the product.

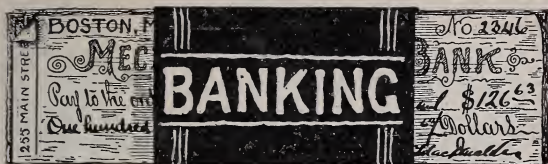
72. Here is a very excellent rule for finding the **area of a triangle** when the three sides are given: From half the sum of the three sides subtract each side separately; multiply the half sum and the three remainders together: the square root of the product will be the area

73. To find the volume of a solid **ring**, multiply the area of a circular section of the ring by the length of the ring.

74. To find the sum of any number of numbers in **arithmetical progression**, as, 2, 4, 6, 8, 10, etc., 1, 2, 3, 4, 5, etc., 3, 6, 9, etc., add the first to the last and multiply half the sum by the number of numbers.

$$75. (a - b) (a + b) = a^2 - b^2.$$

Note. — This subject of **short-methods** is continued under the heading "Shorthand Multiplication" beginning on page 87.



To many people everything connected with **financial transactions** seems to be enveloped in mystery. There is nothing mysterious about a **bank**. It is simply a place where money is deposited, either with or without **interest**, and from whence it may be withdrawn, either with or without notice, according to the rules of the institution. Money is a medium by which business transactions are carried on with all parts of the world, and the care and investment of it is learned by education and experience.

When you enter a bank to **open an account**, inquire for the cashier, and, if convenient, take with you some one who can introduce you and identify you as the person you profess to be. If you go alone, do not feel hurt if a number of questions are asked you. While you may be perfectly honest, a large number of people make their living by being sharp, and, besides, it is necessary to establish those confidential relations which ought to exist in all financial transactions, so that the cashier may know something more about you than he could ascertain by merely looking at you, and taking your name on the book.

The cashier will have you place your **signature** in a book. Your name as written in this book should be the same in style as you intend to place on your checks. If necessary the cashier will show you how to make out a **deposit slip**. He will give you also a small **bank book**, in which you will be credited with the amount of money named on your slip. When you deposit money always go to the **receiving teller** and when you wish to draw money out of the bank, or obtain a draft, present your check to the **paying teller**. When you wish to have your book balanced, hand it to the receiving teller, who will attend to it for you.

A **check** is an order for money drawn by one who has funds in the bank, payable on demand. When the cashier or book-keeper **certifies** a check, he binds the bank as an acceptor. It is the practice to immediately charge such checks to the account of the drawer of the check, although they may not be presented for payment for weeks. For instance if you have a note to pay at one bank and you have your money in another, you must write your check and take it to the bank where you deposit to have it certified. The cashier or some other officer of the bank marks it good. You then take it to the bank where you are not known and take up your note. Checks are usually made payable **to order**. Such checks must be **endorsed** by the person in whose favor they are drawn before they can be cashed. A check drawn **to bearer** is payable to anyone who holds it. If a bank pay a forged check it cannot charge the amount to the depositor whose name has been forged, but it may recover the money from the one who has innocently presented the check and to whom the money was paid, providing the demand for the return is made immediately. If you wish to draw money from your deposit yourself write the check **pay to cash**. Never destroy a certified check. If you do not use it, deposit it again as money, otherwise your account will be just that amount short.

Write plainly in the body of the check **the amount**. Commence to write as far to the left as possible. For instance if you write in this way

. *Nine* *Dollars*

some dishonest person into whose hands the check falls may write "forty" or "ninety" before the "nine" and place a **4** or a **9** before your figure **9**, and in this way very neatly "raise" your check to a large amount. The loss would be yours and not the bank's if such a check were cashed. Put a running line on the blank space following what you have written. For instance if you wrote "twenty," don't give some dishonest per-

son an opportunity to make it "twenty-nine," or to change "five" to "five hundred."

Do not **overdraw**. Your bank will not allow it. An amusing story is told of a lady who opened an account, receiving a check book. In doing her shopping she very soon had given checks for more money than she had deposited. Upon being reminded of the fact by her bankers, she became quite indignant, and said the bank had better get a new book-keeper, as she still had several checks left.

A **draft** is a written order or request from one person to another for the payment of money at a specified time. Drafts afford the safest and most convenient way of remitting money. It is always safest to have a draft made to one's own order, and then endorse it over to the person to whom it is desired to remit.

A **note** is a promise to pay a certain sum of money to a certain person at a given time.

No. 2346
 Date Mar 3 92
 \$936²⁴
 To C. C. & Co.
 For Draft
 for Cash
 Jan. 39
 See folio 231

-R. M. HAMILTON, -
 MAGNOLIA, ARK. March 3 1892
COLUMBIA COUNTY BANK
 Pay TO THE ORDER OF *Robert Cunningham & Co* \$936²⁴
Five hundred and thirty six ²⁴/₁₀₀
R. M. Hamilton

ENDORISING CHECKS.

MORGAN PRINT CO


 TREAS.

A.C. Browne
by W.E. Browne
Atty.

Pay to the order of
R.H. Kingslake
Cunningham & Co
P.H. Kingslake

FOR DEPOSIT ONLY
TO THE CREDIT OF
D.C. HEATH & CO.

Indorsing Checks.

In indorsing checks, note the following points:

1. Write **across** the back—not lengthwise.

2. Don't indorse wrong-end-up. The top of the back is the left end of the face.

3. To **deposit** a check, write your name across the back.

4. Write your name in the **same way** as it appears on the face. For instance, if the check is payable to **W. Brown**, indorse **W. Brown**. If to **Wm. Brown** write **Wm. Brown**. If the spelling of your name is wrong, indorse twice, spelling your name wrong and right.

5. If you wish to make the check payable to some particular person by indorsing, write **Pay to** (NAME) **or order**, and then sign your own name as written on the face.

Do not carry around **indorsed checks** loosely. Such checks are payable to bearer and may be collected by any one.

A check drawn to bearer does not need indorsement. Neither does a check which reads "Pay to Cash" or "Pay to Wages," etc.

Make your notes payable **at the bank** where you keep your deposit. Keep a careful record of the **dates** of maturity. It is customary with nearly all banks to notify the makers of notes a few days before they are due; but this is only an act of courtesy and not an obligation. If another bank holds your note get your banker to certify your check, or, otherwise, take the actual cash with you to pay it. When the third **day of grace** falls on a Sunday, or on a holiday, payment must be made upon the preceding business day. The law regarding endorsements on notes applies the same to endorsements on checks.

Much of the bank's profit is made by **loaning money** on business paper, that is, on notes from houses in good financial standing, which the bank **discounts**. Suppose, for instance, that you receive a note from a customer of yours for \$500 due in two months. You need the cash. To get it, you endorse the note and turn it over to your bank. If the note is pronounced a safe investment by the directors of the bank, the amount less the discount, which in this instance would be six or seven dollars, will be credited to your account.

The **clearing house** is a place to which bankers in commercial centres are in the habit of sending clerks with various bills and checks upon other banks, received in the regular course of business. The representatives of the different institutions exchange checks or drafts, and the balance, on one side or the other, is paid either in cash or clearing-house certificates. This business custom has greatly simplified commercial transactions.

In ordinary every-day business affairs, always write your **name** the same. To the business world your signature becomes as familiar as your face. When affixing your name to deeds, mortgages, wills, and instruments of a permanent nature, always write your name in full. Don't use your ordinary business initials for documents of this kind. Don't trifle with your signature by writing your name on slips of paper and

ion Cl

J House

NOV 28 1888

of the Second Nat Bank of Boston

Brooks. Cashier

cashier

G. S. WHITSON

NAT'L CITY B. N. Y.

Cash'r, or Order for Acct. of

PAY EDWARD C. BROOKS, Esq.

[Handwritten signature]

PAY TO THE ORDER OF
Messrs. D. A. McTAVISH, H. STIDEMAN
and C. F. DEACON, or any two of them
FOR COLLECTION ON ACCOUNT OF
THE QUEBEC BANK, TORONTO.

[Handwritten signature]

MANAGER.

FOR DEPOSIT IN THE
NATIONAL CITY BANK,
FOR CREDIT OF
THE AGENTS OF THE
BANK OF BRITISH N. AMERICA,

[Handwritten signature]

[Handwritten signature]

Agents.

leaving them around loosely. They may fall into evil hands, and give you occasion for regret.

As a general rule, **checks** should be deposited within a few days after they are received.

Money can be **sent to a distant point** by various methods. You can send your own check but the person receiving it will have to return it through his local bank to your bank for collection. You can buy a **draft** from your banker which will be in reality his check on his bank in New York, Chicago, or some other central city. All banks keep money on deposit in other larger banks. Such a draft, commonly called a **cashier's check**, can easily be cashed in any city. Money can be sent through express companies, either in packages, or by **express orders**. Money can be sent through the post-office either by **registered letter** or by **money-order**. Sums under five dollars can be sent by **postal notes**. These are not absolutely safe for the reason that any one can cash them at any large post-office. Money can be sent by **telegraph** either through the telegraph companies or through the express companies.

All checks, after having been paid, are **cancelled and returned**, about the first of each month. They should be carefully filed away for references as receipts.

If you hold an **endorsed note**, be careful when the note becomes due, not to agree to an extension of time without the consent in writing of the endorser. It may be best to draw up a new note, and have both signatures renewed.

When making a **payment of interest** or principal on a note, see that the amount paid and the date are written on the back of the note.

If you **sell a note** payable to your order, it will be necessary for you to write your name upon the back, in order that it may be legally transferred. With the name thus upon the back, you must consider yourself responsible for the payment of the note, in case the maker fails to pay. But if you wish to sell the note and to be relieved of further responsibility, you must write on the back, over your signature the words, "*Without recourse.*"

If a person holds notes against you that are **secured by mortgage**, mark them paid when they are paid but do not destroy them until the last one has been paid and the mortgage discharged.

INTERESTING

Geographical Comparisons.

Asia is more than four times as large as **Europe**, and considerably larger than **North and South America** together.

The **United States** and **Europe** are almost equal in area.

British India is more than half as large as the **United States**.

Canada is nearly equal in area to the **United States** including **Alaska**.

Ireland and **Indiana** are about the same size.

You could take enough land from **Texas** to make **England, Ireland, Scotland, Belgium, the Netherlands, Switzerland and Denmark**, and still have enough left to make **Massachusetts, Rhode Island, Connecticut, New Hampshire, Vermont, Delaware, New Jersey, Maryland, and Indiana**. (See opposite page.)

The island of **Cuba** and **Tennessee** are equal in area.

If all the people of the **United States** and **Canada** were placed in **Texas**, the number of persons to the square mile would be fewer than at present in **China**.

Colorado is as large as **New York, Pennsylvania, and New Jersey** together.

It would take ten states as large as **Massachusetts** to make a state as large as **Kansas**.

There are twenty-seven states each larger than **New York**.

Massachusetts is smaller than either **New Hampshire** or **Vermont**.

Minnesota is twice the size of **Ohio**.

LONDON

BOSTON
ST. LOUIS
GLASGOW
LIVERPOOL
HAMBURG
MOSCOW

300,000

75,000

NEW YORK CITY
(with suburbs)

City of
10,000 Pop

PARIS

PEKIN

CANTON

CHICAGO
BERLIN
PHILADELPHIA
VIENNA
ST. PETERSBURG
TOKIO
BOMBAY



The **three** states bordering on the Pacific are larger than the **thirteen** states bordering on the Atlantic.

Montana is thirty times larger than Connecticut.

Iowa is five times as large as Belgium, and four times as large as Denmark.

Maryland and **Switzerland** are about the same size.

London is as large as New York City, Chicago, Philadelphia, Boston, Baltimore, and Cincinnati together.

Japan is equal in area to Montana, and supports more than half as many people as there are now in the United States.

Ireland had double the population in 1841 that she has at present.

France is about equal in size to Colorado and Arizona.

The **Argentine Republic** is one-third as large as the United States.

New Mexico is about the same size as England, Ireland and Scotland together.

Nebraska is three times as large as Greece.

Germany is as large as Nevada and Oregon together.

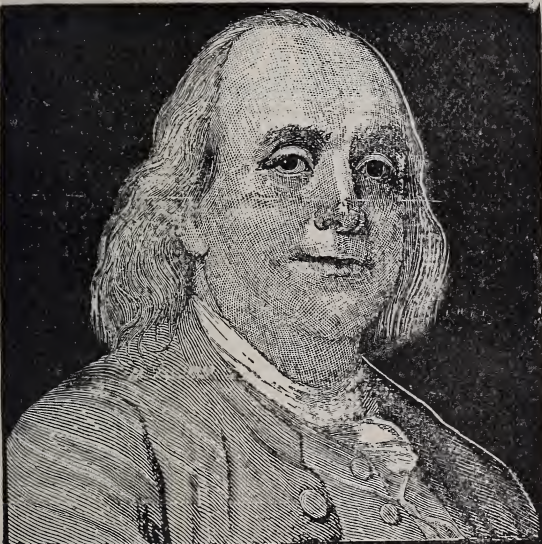
Russia is two and one-half times as large as the United States.

The United States is just **one hundred** times as large as the State of Indiana.

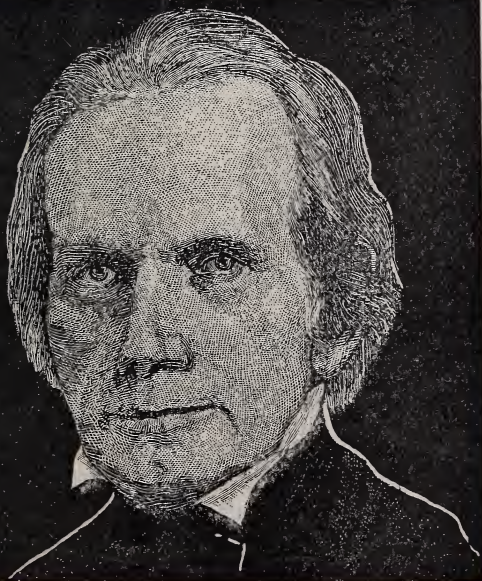
Chicago is scarcely one third of the distance across the continent.

Rome and **Chicago** are on the same parallel of latitude.

London is much farther north of the equator than **Winnipeg**.



WELL KNOWN FACES : WHO ?



BOOK KEEPING

HOW TO KEEP A COMMON SET OF BOOKS.

INTRODUCTORY NOTES.

Every person, whether actively engaged in business or not, should keep a **systematic record** of his dealings with others. There are certain well defined principles which should always be adhered to, but the application of these must ever depend largely on the nature of the transactions recorded.

A person who buys an article or employs the labor of another, for which he does not pay at the time, is said to become indebted for it, and is called a **debtor**.

A person who sells an article or performs labor for another, without receiving his pay at the time, is said to give credit for it, and is called a **creditor**.

Cash includes specie, bank notes, and checks.

An **invoice** is an itemized statement of articles sold, with the date of sale, and the prices.

The **assets** or **resources** indicate the entire property belonging to a business. **Liabilities** are debts, and include all which the business owes, both on account and on notes.

In these few pages the author has endeavored to explain in a very simple way the best method of keeping a common set of books. It is not necessary to keep an elaborate system of accounts for an ordinary retail, country or town store. The books must be neat, accurate, and convenient of reference. These are the chief essentials.

BOOKS NECESSARY.

Let us imagine, for illustration, the business of a **merchant in a country town**. Suppose his stock to consist of both dry goods and groceries, and also that he buys eggs and butter from his farm customers. Let his sales be for cash, trade, and on credit. For such a business the following books are necessary:

1. **Sales-book.** This book should be kept open in a convenient part of the store so that clerks can make the credit at entries the time of sales. If

one particular clerk makes all the entries, the clerk who makes the sale should take down the necessary items and hand to the other. Of course only credit sales are entered in the sales-book, except at the end of the day when the total cash received during the day is entered as "Cash sales this day;" then this amount added to the sum of the credit sales as shown on the sales-book will give the total business for the day.

2. **Cash-book.** This is a very easy book to keep but the greatest care should be taken to keep it in a neat and absolutely accurate way. The cash on hand or in the till at the end of the day should always equal the cash on hand as shown in the cash-book. If a bank account is kept it is better to enter in the cash-book the amount deposited just the same as though it were paid out. Bills and accounts paid by check should be entered in the bank-book and not the cash-book, and should be transferred when necessary from the bank-book to the ledger. It is easier and simpler to keep the bank items and cash items separate in this way.

3. **Bill-book.** If you give or take many notes you should buy a regularly printed bill-book in which to make your memoranda. In this way your bills payable and bills receivable can very easily be referred to.

4. **Stock-book.** When you are buying stock including farm produce, from time to time. Write in it at the beginning of your year the actual (cost) value of the stock on hand, and then as new stock comes into the store make an entry for each purchase. When a quantity is bought from your wholesale house, simply enter the total amount of the invoice, and file the invoice in your invoice book or in a file for this purpose. This book will show the total amount of new goods and produce which you add to your stock each month, and will be very convenient for reference.

5. **Ledger.** This, of course, will be your principal book. In it you will open accounts with all

persons from whom you buy on credit and to whom you sell on credit. A transaction might be at once entered under its proper head in the ledger but for the liability to error in the hurry of business; and it is better to make a record of the day's business by itself, making the original entries in your sales-book for merchandise sold and in your stock-book for merchandise bought. The items should be transferred from these books to the ledger at the close of the day. For ordinary accounts it is not necessary to have the ledger pages divided into debit and credit sides as in double entry. If you have dealings with a man from whom you buy on credit and to whom you sell on credit, it is best to take two pages of your ledger facing each other, putting the debit articles, or the things bought, on the left hand page, and the credit articles, or the things sold, on the right hand page. In the exercises which follow the several books are fully illustrated.

IMAGINARY TRANSACTIONS.

The following transactions are such as might be recorded in a single day by a **general merchant** in a country town. These transactions are given to illustrate how they should appear in his account books. Suppose the **cash on hand** the evening before as shown by the cash-book and the till, is \$47.60, and consider the day to be

Thursday, November 3, 1892.

1	Sold T. R. Walmsley on account				
	5 yds white Flannel, 38c.	1.90			
	6 yds. Print, 12c.	.72			
	12 lbs. Sugar, 7c.	.84			
	2 lbs. Tea, 45c.	.90	4		36
2	Bought of Mrs. Thomas Gilray, 42 lbs. of Butter at 27 cents, and sold her groceries in full payment.		11		34
3	Received from Thomas Jordan, cash \$12, being rent for October for House on Centre St.				

BOOK KEEPING.

4	Sold John Knott on account 3 lbs. Coffee, 35c. 1.05 2 pairs Boots, 2.50, 3.00 5.50 1 Derby Hat, 2.00	8	55
5	Paid my clerk, Harry Wallace, \$20 being wages for October.		
6	Received from C. F. Snelgrove on account \$15.		
7	Bought of Mrs. Richard Ball 12 doz. Eggs at 13c., and 24 lbs. Butter at 28c. Credit account with the amount.		
8	Paid Advertising in "Weekly Leader" for October, \$8.50.		
9	Sold P. M. Pierce as follows 13 yds. Cotton, 11c. 1.43 8 yds. Tweed 1.25 10.00 4 yds. Flannel, .55 2.20 5 lbs. Tea, .60 3.00	16	63
	Received \$12 cash. Balance on account.		
10	Bought 6 Turkeys for cash, \$7.45.		
11	Received from A. Riley the sum \$18.50 in full of account for October.		
12	Cash sales this day	33	64

These twelve items cover a variety of transactions. They are numbered simply for reference in the hints and suggestions which follow. Your **sales-book** or **blotter** should contain the items just about as they are printed here. By carrying out items 1, 2, 4, 9 and 12 to a separate right-hand column, you can foot it up at the end of the day and find that your **total sales** (not your total receipts) for the day have been \$84.52. Of course you do not take any record of the **cash sales**. All cash received is put in the till and the actual amount received can be found by counting it. It is best, however, for each salesman, when he makes a cash sale, to put the amount on a **ticket** and put the ticket, with the cash, in the till. These tickets can be added up at the end of the day and the amount compared with the cash. Note the following

Hints and Suggestions.

No. 1. This transaction must be entered in Walmsley's account in the Ledger.

No. 2. In this transaction the amount is written out in the column to denote the sales. The purchase of the butter will appear in the stock-book. It is not necessary to write Mrs. Gilray's name except for reference.

No. 3. This transaction will appear in the Cash Book. If the money is placed in the till, care must be taken not to count it in with the day's cash sales. If an account is kept with Jordan in the Ledger, the item might be entered there also.

No. 4. This transaction will be treated the same as No. 1.

No. 5. This item will appear in the Cash Book. The cash should not be taken from the money received during the day except a ticket be placed in the till for it, so there will be no trouble about adding up the day's sales.

No. 6. Enter in the Cash Book, also credit Snelgrove's account in the Ledger.

No. 7. Enter in the Stock Book to show merchandise, or produce bought. Credit Richard Ball's account in the Ledger just the same as though he had paid the amount in cash.

No. 8. Enter in the Cash Book. If an account is kept with the "Leader" in the Ledger enter the item there. As a general rule it is best not to open accounts in your Ledger where you owe others and where you pay the bills almost as soon as they are rendered. Have the bills receipted and file them. This is all that is necessary.

No. 9. Enter in P. M. Pierce's account in the Ledger, charging him with all the items and then giving him credit for \$12. The cash payment should appear also in your Cash Book. This item should not appear in the first cash sales but rather as money paid on account.

No. 10. Enter in Stock Book, also in Cash Book.

No. 11. Enter in Cash Book, and credit Riley's account in the Ledger. Note that this item is not carried out. It must not be counted in as part of the day's sales.

No. 12. Enter in Cash Book.

In the illustrations which follow these twelve transactions appear as they should appear in the **other books**. The items should be entered in the Cash Book **daily**. The items for the other books may be transferred anytime when it is convenient. As soon as an item is **posted** from the Sales Book, or Blotter, write a blue pencil check mark (✓) in front of it to show that it has been entered.

BOOK KEEPING.

Cash, November, 1892.

		Balance on hand		47	60
Nov	3	Received this day			
		T. Jordan, Rent	12.00		
		C. F. Snelgrove, acct.	15.00		
		P. M. Pierce, acct.	12.00		
		A. Riley, acct.	18.50		
		Cash Sales	33.64	91	14
				138	74
		Cash paid this day			
		Harry Wallace, wages	20.00		
		Weekly Leader	8 50		
		Produce (Turkeys)	7.45	35	95
		Balance on hand		102	79

The **balance on hand** should agree exactly with the amount in the till. If money is taken out for **private use** during the day, write the amount on a slip of paper and put it in the till. Enter all such items in the Cash Book. If your cash does not balance don't leave until you find out where the mistake is.

Stock Account, November, 1892.

Nov	3	Produce bought this day			
		42 lbs. Butter, 27c.	11.34		
		12 doz. Eggs, 13c.	1.56		
		24 lbs. Butter, 28c.	6.72		
		6 Turkeys,	7.45	27	07

It is not necessary to enter from whom bought. The month's purchases should be footed up, so that, at the end of the year, the gross purchases can be added to the purchases made from your **wholesale houses**, records of which are best kept by filing the invoices in an **invoice book**. It is rather difficult to give a good illustration of the **Ledger** without having

a larger number of transactions than are recorded in one day's business. The accounts below show how the particular items of this day should be entered :

T. R. Walmsley.

Nov	3	5 yds. Flannel, 38c. 1.90, 6 yds. Print, 12c. 72c., 12 lbs. Sugar, 7c., 84c., 2 lbs. Tea, 45c. 90c.	4	36
-----	---	---	---	----

If T. R. Walmsley should pay **cash on account** write "*credit by cash*," giving the date, and enter the amount in the right-hand money column. The left-hand money column is the **debit** column. The amount we give out, whether goods, or cash, or labor, is written there. The right-hand money column is the **credit** column. In it we write what we receive, whether goods, or services, or cash. John Knott's account will be similar to T. R. Walmsley's. In C. F. Snelgrove's account we simply enter "*Credit by cash* \$15." Write the amount in the right-hand column.

Richard Ball.

Nov	3	Credit by Eggs and Butter as per stock Book.	12	90
-----	---	--	----	----

It is not necessary to **write out the items** again. When making out Richard Ball's bill simply write "*credit by eggs and butter* \$12.90," just as though he had paid this amount in cash. Of course, we presume here that several other transactions have been previously entered in his account.

P. M. Pierce.

Nov	3	13 yds. Cotton, 11c. 1.43, 8 yds. Tweed, 1.25, 10.00, 4 yds. Flannel, 55c., 2.20, 5 lbs. Tea, 60c. 3.00. Credit by Cash	16	63	12	00
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When entering an item such as that given in transaction No. 11, it would be well to **close up the account**. The account for the next month can be opened immediately under the closing lines.

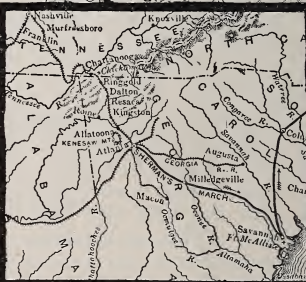
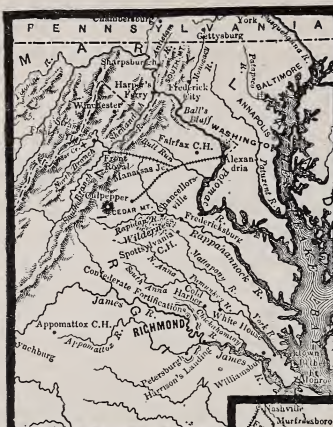
GENERAL INFORMATION.

The value of the goods can be known only by accurate count and estimation, and must be clearly stated both at the beginning and at the end of a term of business. An **inventory** should be taken yearly. This should show the goods on hand at the beginning of the year, the goods bought during the year, and the goods remaining on hand. The **balance sheet** should show the resources and liabilities both at the beginning and at the end of the year. It should really be an abridged history of the business. Every business man should know exactly what his **profits and losses** have been. Wrong estimates are ruinous, and it is better to see the truth than to continue an enterprise on a mistaken basis.

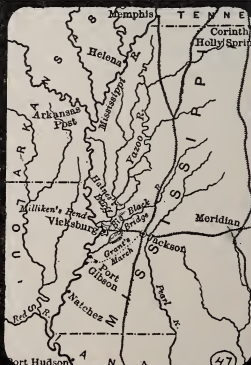
You should keep a **stock or capital account** in your Ledger. This should show the original capital which you invested, and the yearly additions. This account may be opened under your own name. Credit it with the cash and other resources invested and debit it with your liabilities. Debit this account with the sum total of the moneys or goods which you draw from the business for your **private use**. The **net loss** is also debited to it, and the **net gain** credited.

Although the merchant's account-books are his private records, they also partake of the nature of a trust, and should bear internal evidence of being **kept honestly and in good faith**. They should be competent to bear the scrutiny of creditors, if it become expedient or necessary. If **errors** are made, they should be so corrected as to show the original error, and the reason for its correction. Account-books should be so plain and clear as to be understood at once by a stranger who sees them for the first time, and explicit and ample enough for the guidance of an executor or administrator, in case of the merchant's death.

NOTE.—For the boy who is studying at home, for the merchant whose business is increasing, for the young man ambitious to become a book-keeper, and for the experienced accountant who is looking for the newest ideas about the management of “A 1” city houses, there is no better or more complete work on Book-keeping than that written and published by J. H. Goodwin.



WAR MAPS.





Curious Questions.

1. What is cold ?
2. Where do figures go when you rub them out ?
3. What lake is more *wet* than any other in the world? (*Wetter.*)

4. When does water run up hill? (*As sap in trees.*)

5. Why does running make one warm ?

6. What was the original "Baker's Dozen?"

It was the Devil's dozen, thirteen being the number of witches supposed to sit down together at their great meeting. Hence the superstition about thirteen at a table. The baker was an unpopular character and became a substitute for Satan.

7. What is the name of the oldest street in the world? (The street which is named *Straight*, in Damascus.)

8. Into what American college are ministers not allowed to enter ?

Girard College, Philadelphia. Due to a noted peculiarity of the will of Stephen Girard who was an infidel.

9. Which are the unlucky days for matrimony ?

Prospective brides may be interested to learn that there are thirty-two days in the year on which it is unlucky to marry, according to the authority of a manuscript dated in the fifteenth century. These days are January 1, 2, 4, 5, 7, 10, 15; February 6, 7, 18; March 1, 6, 8; April 6, 11; May 5, 6, 7; June 7, 15, July 5, 19; August 15, 19; September 6, 7; October 6; November 15, 16; and December 15, 16, and 17. Consequently January is the worst month and October the best month in the year for marriage.

10. Where is the most remarkable echo in the world ?

The most noted one known is that on the north side of a church of Shipley, England; it repeats twenty-one syllables.

11. When was the year without a summer ?

The year 1816. Old New England farmers formerly referred to this year as "eighteen hundred and froze to death." June, July and August were noted for snow

and ice all through New England and the Atlantic States.



12. What common animal has four toes on each hind foot?

13. Have sheep front teeth? Have cows?

14. Can you see steam?

15. What is the Algebraic Paradox?

The proof that $2 = 1$. It is shown as follows:

$$\begin{aligned} x &= r; \\ x^2 &= r^2 \text{ or } x \times r; \\ (x + r)(x - r) &= (x - r). \end{aligned}$$

Cancelling the two quantities $x - r$, as their division is equal,—that is, they balance each other, there is left

$$\begin{aligned} x + r &= x; \\ x + x &= x; \\ 2x &= x; \\ 2 &= 1. \end{aligned}$$

—the number 1 being understood before all single quantities.

16. Why does a lamp smoke when the wick is trimmed unevenly?

17. What is smoke?

18. What is weight?

19. Which is heavier a pound of feathers or a pound of gold?

20. Why will hot iron bend more easily than cold?

Short Hand MULTIPLICATION

Under this heading we give a full and complete explanation of some peculiarities of figures which have been taken advantage of in framing rules for shortening the process of multiplication.

Multiply 34 by 26.

Note these numbers. The left-hand figures are the same and the right-hand figures add to ten. To find the product, say 6 times 4 are 24, putting down both figures; carry *one*, and say 4 times 3 are 12, putting down both figures. Always carry *one*. Note the numbers to which this rule applies.

<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>
<u>18</u>	<u>17</u>	<u>16</u>	<u>15</u>

In the teens.

<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>
<u>29</u>	<u>28</u>	<u>27</u>	<u>26</u>	<u>25</u>

In the twenties.

<u>31</u>	<u>32</u>	<u>33</u>	<u>34</u>	<u>35</u>
<u>39</u>	<u>38</u>	<u>37</u>	<u>36</u>	<u>35</u>

In the thirties.

<u>41</u>	<u>42</u>	<u>43</u>	<u>44</u>	<u>45</u>
<u>49</u>	<u>48</u>	<u>47</u>	<u>46</u>	<u>45</u>

In the forties.

<u>51</u>	<u>52</u>	<u>53</u>	<u>54</u>	<u>55</u>
<u>59</u>	<u>58</u>	<u>57</u>	<u>56</u>	<u>55</u>

In the fifties.

<u>61</u>	<u>62</u>	<u>63</u>	<u>64</u>	<u>65</u>
<u>69</u>	<u>68</u>	<u>67</u>	<u>66</u>	<u>65</u>

In the sixties.

<u>71</u>	<u>72</u>	<u>73</u>	<u>74</u>	<u>75</u>
<u>79</u>	<u>78</u>	<u>77</u>	<u>76</u>	<u>75</u>

In the seventies.

<u>81</u>	<u>82</u>	<u>83</u>	<u>84</u>	<u>85</u>
<u>89</u>	<u>88</u>	<u>87</u>	<u>86</u>	<u>85</u>

In the eighties.

<u>91</u>	<u>92</u>	<u>93</u>	<u>94</u>	<u>95</u>
<u>99</u>	<u>98</u>	<u>97</u>	<u>96</u>	<u>95</u>

In the nineties.

This rule applies also to numbers of more than two figures each. Note the following examples :

$$\begin{array}{r} 112 \\ 118 \end{array} \quad \begin{array}{r} 113 \\ 117 \end{array} \quad \begin{array}{r} 114 \\ 116 \end{array} \quad \begin{array}{r} 115 \\ 115 \end{array} \quad \begin{array}{r} 123 \\ 127 \end{array}$$

$$\begin{array}{r} 129 \\ 121 \end{array} \quad \begin{array}{r} 132 \\ 138 \end{array} \quad \begin{array}{r} 193 \\ 197 \end{array} \quad \begin{array}{r} 194 \\ 196 \end{array} \quad \begin{array}{r} 295 \\ 295 \end{array}$$

$$\begin{array}{r} 392 \\ 398 \end{array} \quad \begin{array}{r} 393 \\ 397 \end{array} \quad \begin{array}{r} 491 \\ 499 \end{array} \quad \begin{array}{r} 792 \\ 798 \end{array} \quad \begin{array}{r} 996 \\ 994 \end{array}$$

The difficulty, if any, will arise in multiplying the two left-hand figures of each, for instance, in 132 by 138, we say 8 times 2 are sixteen, then carry *one*, and 14 times 13 are 172, giving the answer 17,216. When we carry *one* to 39, for instance, we make it 40, and the product of 40 and 39 is easily obtained by mental process.

Multiply 66 by 82.

Here the two figures of one product are the same and the two figures of the other product add to ten. The rule is the same. Twice 6 are 12, put down both figures; carry *one*, and 9 times 6 are 54, giving the product 5412. Note a few of the numbers to which this rule applies :

$$\begin{array}{r} 66 \\ 82 \\ \hline 5412 \end{array} \quad \begin{array}{r} 22 \\ 73 \end{array} \quad \begin{array}{r} 22 \\ 64 \end{array} \quad \begin{array}{r} 22 \\ 55 \end{array} \quad \begin{array}{r} 22 \\ 28 \end{array} \quad \begin{array}{r} 22 \\ 82 \end{array} \quad \begin{array}{r} 22 \\ 37 \end{array}$$

$$\begin{array}{r} 22 \\ 91 \end{array} \quad \begin{array}{r} 22 \\ 19 \end{array} \quad \begin{array}{r} 22 \\ 46 \end{array} \quad \begin{array}{r} 33 \\ 73 \end{array} \quad \begin{array}{r} 33 \\ 37 \end{array} \quad \begin{array}{r} 33 \\ 82 \end{array}$$

$$\begin{array}{r} 44 \\ 91 \end{array} \quad \begin{array}{r} 55 \\ 82 \end{array} \quad \begin{array}{r} 66 \\ 73 \end{array} \quad \begin{array}{r} 77 \\ 64 \end{array} \quad \begin{array}{r} 88 \\ 46 \end{array} \quad \begin{array}{r} 99 \\ 28 \end{array}$$

Multiply 31 by 68.

The *complement* of a number is the number which added to it makes an even ten, or an even 100, or an even 1000. Thus the complement of 8 is 2, of 93 is 7, etc.

The complement of 8 is 2. Now suppose for the 8 in this example we put 2 and then by cross-multiplication we have $3 \times 2 = 6 \times 1$. Whenever (by the use of one complement) the products by cross-multiplication are equal this same rule applies. In this example say 8 times 1 are 08, carry *one* and say 7 times 3 are 21, which gives as product 2108. This adds a very large num-

$$\begin{array}{r} 31 \\ 68 \\ \hline 2108 \end{array}$$

ber of numbers to our list. Note the following and apply the rule to each :

<u>13</u> <u>24</u>	<u>13</u> <u>31</u>	<u>14</u> <u>22</u>	<u>28</u> <u>16</u>	<u>17</u> <u>26</u>	<u>24</u> <u>18</u>
<u>48</u> <u>18</u>	<u>22</u> <u>19</u>	<u>21</u> <u>48</u>	<u>21</u> <u>67</u>	<u>22</u> <u>46</u>	<u>23</u> <u>44</u>
<u>23</u> <u>61</u>	<u>24</u> <u>34</u>	<u>39</u> <u>24</u>	<u>24</u> <u>42</u>	<u>26</u> <u>31</u>	<u>36</u> <u>26</u>
<u>48</u> <u>26</u>	<u>46</u> <u>27</u>	<u>69</u> <u>27</u>	<u>42</u> <u>29</u>	<u>63</u> <u>29</u>	<u>84</u> <u>29</u>
<u>31</u> <u>68</u>	<u>31</u> <u>97</u>	<u>32</u> <u>66</u>	<u>32</u> <u>94</u>	<u>48</u> <u>34</u>	<u>34</u> <u>62</u>
<u>36</u> <u>42</u>	<u>68</u> <u>36</u>	<u>64</u> <u>38</u>	<u>96</u> <u>38</u>	<u>93</u> <u>39</u>	<u>41</u> <u>88</u>
<u>42</u> <u>86</u>	<u>43</u> <u>84</u>	<u>46</u> <u>61</u>	<u>86</u> <u>47</u>	<u>63</u> <u>48</u>	<u>84</u> <u>48</u>
<u>82</u> <u>49</u>	<u>93</u> <u>68</u>	<u>96</u> <u>66</u>	<u>12</u> <u>26</u>	<u>88</u> <u>55</u>	<u>62</u> <u>97</u>

This application of this rule holds good also with numbers of three figures each, or numbers where one factor contains three figures and the other two. It holds good also in fractional numbers. Note the following examples :

<u>128</u> <u>94</u>	<u>146</u> <u>77</u>	<u>126</u> <u>86</u>	<u>328</u> <u>88</u>	<u>246</u> <u>49</u>
<u>105</u> <u>143</u>	<u>147</u> <u>124</u>	<u>246</u> <u>127</u>	<u>168</u> <u>181</u>	<u>164</u> <u>283</u>
<u>43</u> <u>121</u>	<u>53</u> <u>151</u>	<u>62</u> <u>242</u>	<u>84</u> <u>143</u>	<u>92</u> <u>186</u>

This same simple rule applies also to fractional numbers, more especially to numbers where only one of the factors is fractional. Note the following examples, and in finding the product, say $6\frac{1}{2}$ times 7 are $45\frac{1}{2}$ and put down the whole product ; then carry *one*, and say 5 times 8 are 40, giving the answer $4045\frac{1}{2}$.

<u>87</u> <u>46</u> $\frac{1}{2}$	<u>93</u> <u>48</u> $\frac{2}{3}$	<u>42</u> <u>38</u> $\frac{1}{2}$	<u>65</u> <u>37</u> $\frac{1}{2}$	<u>49</u> <u>17</u> $\frac{3}{4}$
<u>74</u> <u>38</u> $\frac{2}{7}$	<u>34</u> <u>70</u> $\frac{2}{3}$	<u>63</u> <u>38</u> $\frac{1}{2}$	<u>37</u> <u>17</u> $\frac{2}{3}$	<u>98</u> <u>37</u> $\frac{1}{3}$

The author does not claim that this application is practical, for the reason that the application of the rule cannot be seen at a glance. It shows, however, to what extent this very simple discovery can be carried. The rule applies also in quite large numbers. Note the following:

$$\begin{array}{r} 276 \\ 362 \\ \hline \end{array} \quad \begin{array}{r} 843 \\ 1126 \\ \hline \end{array} \quad \begin{array}{r} 1127 \\ 1282 \\ \hline \end{array} \quad \begin{array}{r} 2568 \\ 2243 \\ \hline \end{array}$$

Multiply 76 by 36.

$$\begin{array}{r} 76 \\ 36 \\ \hline 2736 \end{array}$$

This is a modification of the same rule. Note that the left-hand figures add to ten and the right-hand figures are the same. The process is as follows:

$$\begin{array}{l} 6 \times 6 = 36 \\ 7 \times 3 + 6 = 27 \end{array}$$

Instead of carrying *one*, you carry one of the unit numbers (in this instance *six*), and add it, not to either of the *tens*, but to their product. Note the following examples

$\begin{array}{r} 26 \\ 86 \\ \hline \end{array}$	$\begin{array}{r} 25 \\ 85 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ 84 \\ \hline \end{array}$	$\begin{array}{r} 23 \\ 83 \\ \hline \end{array}$	$\begin{array}{r} 22 \\ 82 \\ \hline \end{array}$	$\begin{array}{r} 21 \\ 81 \\ \hline \end{array}$
$\begin{array}{r} 27 \\ 87 \\ \hline \end{array}$	$\begin{array}{r} 28 \\ 88 \\ \hline \end{array}$	$\begin{array}{r} 29 \\ 89 \\ \hline \end{array}$	$\begin{array}{r} 31 \\ 71 \\ \hline \end{array}$	$\begin{array}{r} 32 \\ 72 \\ \hline \end{array}$	$\begin{array}{r} 33 \\ 73 \\ \hline \end{array}$
$\begin{array}{r} 34 \\ 74 \\ \hline \end{array}$	$\begin{array}{r} 35 \\ 75 \\ \hline \end{array}$	$\begin{array}{r} 36 \\ 76 \\ \hline \end{array}$	$\begin{array}{r} 37 \\ 77 \\ \hline \end{array}$	$\begin{array}{r} 38 \\ 78 \\ \hline \end{array}$	$\begin{array}{r} 39 \\ 79 \\ \hline \end{array}$
$\begin{array}{r} 41 \\ 61 \\ \hline \end{array}$	$\begin{array}{r} 42 \\ 62 \\ \hline \end{array}$	$\begin{array}{r} 43 \\ 63 \\ \hline \end{array}$	$\begin{array}{r} 44 \\ 64 \\ \hline \end{array}$	$\begin{array}{r} 45 \\ 65 \\ \hline \end{array}$	$\begin{array}{r} 46 \\ 66 \\ \hline \end{array}$
$\begin{array}{r} 47 \\ 67 \\ \hline \end{array}$	$\begin{array}{r} 48 \\ 68 \\ \hline \end{array}$	$\begin{array}{r} 49 \\ 69 \\ \hline \end{array}$	$\begin{array}{r} 51 \\ 51 \\ \hline \end{array}$	$\begin{array}{r} 52 \\ 52 \\ \hline \end{array}$	$\begin{array}{r} 53 \\ 53 \\ \hline \end{array}$
$\begin{array}{r} 54 \\ 54 \\ \hline \end{array}$	$\begin{array}{r} 55 \\ 55 \\ \hline \end{array}$	$\begin{array}{r} 56 \\ 56 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ 57 \\ \hline \end{array}$	$\begin{array}{r} 58 \\ 58 \\ \hline \end{array}$	$\begin{array}{r} 59 \\ 59 \\ \hline \end{array}$

The same rule applies to larger numbers. In the following examples add double the unit figure. Always add *double* when the sum of the tens is 20; when 30, add three times the *unit* number and so on.

$$\begin{array}{r} 126 \\ 86 \\ \hline 10836 \end{array} \quad \begin{array}{l} 6 \times 6 = 36 \\ 8 \times 12 \times (\text{double } 6) = 108 \end{array}$$

<u>133</u> <u>73</u>	<u>134</u> <u>74</u>	<u>135</u> <u>75</u>	<u>136</u> <u>76</u>	<u>137</u> <u>77</u>
<u>142</u> <u>62</u>	<u>143</u> <u>63</u>	<u>144</u> <u>64</u>	<u>145</u> <u>65</u>	<u>146</u> <u>68</u>
<u>151</u> <u>51</u>	<u>153</u> <u>53</u>	<u>154</u> <u>54</u>	<u>157</u> <u>57</u>	<u>159</u> <u>59</u>
<u>162</u> <u>48</u>	<u>163</u> <u>43</u>	<u>165</u> <u>45</u>	<u>167</u> <u>47</u>	<u>161</u> <u>41</u>
<u>183</u> <u>23</u>	<u>184</u> <u>24</u>	<u>185</u> <u>25</u>	<u>186</u> <u>26</u>	<u>188</u> <u>28</u>

Multiply 32 by 52.

Here the left-hand figures add to 8, and the right-hand figures are the same. Instead of saying *twice*

$$\begin{array}{r} 32 \\ 52 \\ \hline 1664 \end{array} \quad \begin{array}{l} 8 \times 8 = 64 \\ 5 \times 3 + 2 - 1 = 16 \end{array}$$

two, take the complements 8 and 8 and multiply them for the first two figures of the product. Find

the remaining figures as in the last rule, only subtract *one* in every case from your result. Five times 3 plus 2 less 1 equals 16. Apply this modification to the following examples:

<u>23</u> <u>63</u>	<u>24</u> <u>64</u>	<u>25</u> <u>65</u>	<u>26</u> <u>66</u>	<u>27</u> <u>67</u>	<u>28</u> <u>68</u>
<u>32</u> <u>52</u>	<u>33</u> <u>53</u>	<u>34</u> <u>54</u>	<u>35</u> <u>55</u>	<u>36</u> <u>56</u>	<u>39</u> <u>59</u>
<u>41</u> <u>41</u>	<u>32</u> <u>42</u>	<u>43</u> <u>43</u>	<u>44</u> <u>44</u>	<u>45</u> <u>45</u>	<u>47</u> <u>47</u>
<u>13</u> <u>73</u>	<u>14</u> <u>74</u>	<u>15</u> <u>75</u>	<u>16</u> <u>76</u>	<u>17</u> <u>77</u>	<u>18</u> <u>78</u>

The same rule applies to larger numbers. When the sum of the tens is 18, add double one of the unit numbers; when 28, add three times the unit number, and so on. Note the following examples:

<u>124</u> <u>64</u>	<u>125</u> <u>65</u>	<u>123</u> <u>63</u>	<u>128</u> <u>68</u>	<u>127</u> <u>67</u>
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<u>231</u> <u>51</u>	<u>232</u> <u>52</u>	<u>233</u> <u>53</u>	<u>234</u> <u>54</u>	<u>239</u> <u>59</u>
<u>542</u> <u>42</u>	<u>643</u> <u>43</u>	<u>744</u> <u>44</u>	<u>849</u> <u>49</u>	<u>947</u> <u>47</u>

When the sum of the left-hand figures is 5 and the right-hand figures are alike, add one-half of the *like* number to the product of the left-hand numbers, as :

$$\begin{array}{r} 36 \\ 26 \\ \hline 936 \end{array} \quad \begin{array}{l} 6 \times 6 = 36 \\ 3 \times 2 + (\frac{1}{2} \text{ of } 6) = 9 \end{array}$$

If the right-hand numbers are odd, it will be impossible to take an even *half*. The difficulty can be over-

come by making the half a *decimal* and adding it in. In this example, if it were 37 by 27, the product would be 999. Here we have 7 times 7 are 49, and 50 (the decimal of $3\frac{1}{2}$ or 3.50) makes 99. If the sum of the left-hand figures is 15, add *one and one half* times the *equal* number; if the sum is 25, add *two and one half* times the *equal* number. Note the following examples and apply this rule to each :

<u>32</u> <u>22</u>	<u>34</u> <u>24</u>	<u>38</u> <u>28</u>	<u>31</u> <u>21</u>	<u>33</u> <u>23</u>	<u>35</u> <u>25</u>
<u>37</u> <u>27</u>	<u>45</u> <u>15</u>	<u>47</u> <u>17</u>	<u>46</u> <u>16</u>	<u>48</u> <u>18</u>	<u>49</u> <u>19</u>
<u>86</u> <u>76</u>	<u>84</u> <u>74</u>	<u>85</u> <u>75</u>	<u>83</u> <u>73</u>	<u>82</u> <u>72</u>	<u>88</u> <u>78</u>
<u>63</u> <u>93</u>	<u>64</u> <u>94</u>	<u>65</u> <u>95</u>	<u>66</u> <u>96</u>	<u>67</u> <u>97</u>	<u>62</u> <u>92</u>

The same rule applies to numbers of more than two figures each. Note the following :

<u>135</u> <u>25</u>	<u>127</u> <u>37</u>	<u>172</u> <u>182</u>	<u>169</u> <u>199</u>	<u>238</u> <u>328</u>
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When the sum of the left-hand figures is 3, or 13, or 23, proceed as when 5, or 15, or 25, only deduct *one* from your left-hand total. That is, when you find the product of the left-hand numbers, deduct *one*, then add as before.

There are many other modifications, rules and exceptions. These, however, are the most practical, and will be found of great benefit to all who give them study.

#REPORTING

NECESSARY QUALIFICATIONS.

You cannot get out a **newspaper** by simply turning a crank. The chief thing needful is capacity. Brains have to be well mixed with printers' ink and machinery.

Only **long years of experience**, and patient, unwearied application, backed by a natural fund of common sense and sound judgment, and a love for the business, can ever make a proficient editor. This view may appear discouraging; but the man who intends to adopt journalism as his business, and is ambitious to deserve the title of editor, may as well make up his mind at the start that he has a stupendous task before him, and look upon his first three or four years of labor in that sphere as a rigorous apprenticeship, in which he must work hard and exercise an uncommon amount of patience.

There are but few thorough editors who have not, at one time or other, been **reporters**; and there are many excellent newspaper men who do both editing and reporting with equal facility. A good reporter must be a short-hand writer, although there are many reporters doing special work who are not; he must be a news-gatherer, and, if he is a good one, he will aim to collect all the facts possibly obtainable relative to any event he is detailed to write up, and to relate them in good, plain and simple language. Neither the ability to write verbatim, nor a good memory is so much to be desired as the ability to write a condensed report intelligibly. The experienced newspaper reporter avoids the error of having a two-column report cut down to six inches.

Don't run away with the idea, however, that because you can write **shorthand**, you are qualified to be a reporter. Reporters are created by a long and varied experience. They must be educated in the ways of

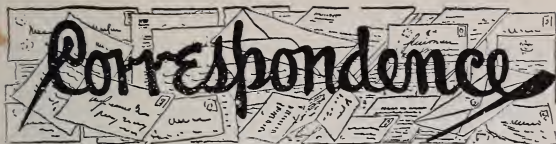
the world, understand the intricacies of public life, and possess faculties which find no place a in school curriculum. Newspaper men are not easily manufactured by any process of education. Their calling is one that requires peculiar qualities. The best men gradually work their way up from the composing room, the office, or the country paper.

As to the style in which a paragraph should be written, the simpler the better. American newspapers, however, prefer a florid style. "This will never do," said a local editor to a new reporter. "You say that 'the man was killed.' That is too tame. You should have said that 'he was crushed into a shapeless mass,' or 'his reeking corpse presented a ghastly sight.' Then you make the bald statement that 'the doctor was not needed.' 'The services of a physician were not called into requisition,' that's how you should have put it. That's journalism, that is. Then you say nothing of the 'sickening spectacle,' and you are painfully neglectful of the fact that 'the man's features were distorted out of all semblance to humanity,' and you haven't a word to say of 'scattered fragments,' or of 'blood,' or of 'bruises,' or 'the screams of the horrified spectators.' No, it will never do; journalism has no use for you, young man."

In the position of **sub-editor** there is no language, no knowledge, no sort of information, no kind of experience in business, in literature, in pleasure, in law, and indeed, in anything in human life, that will not come in useful, and increase the professional capacity of the man who possesses it.

The **interviewer** is a creation of American civilization. A famous Englishman was asked in Chicago, by a reporter, for some particulars of his private life. He replied that he hadn't a private life; it was stopped at the custom house in New York. The qualifications of a successful interviewer are as varied as his work.

Newspapers ignore the really good **news of the day**. Every nerve is strained in order to photograph the worst features of our civilization. The squabbles of political parties, the latest murder or hanging, the silliest breach of promise case or scandal, the latest betting or horse-racing—these form the principal contents of the average daily paper. Sensationalism is the keynote.



KINDS OF LETTERS.

The primary idea of a letter is **conversation at a distance**. If this be kept in mind, one can scarcely fail to write appropriately, if one can converse properly; for a letter may be familiar or reserved, jocular or dignified, according to the relations between the writer and the person addressed.

Letters of **friendship** should be simple and natural. It is the little things, the incidents of every day life, the home-chat which makes a friendship letter interesting. Letters of **courtesy** include invitations, acceptances, letters of congratulation, of condolence, of introduction, and of recommendation. Letters of **business** include all correspondence regarding business affairs. **Public** letters embrace communications to newspapers regarding public affairs. Frequently a writer publishes a letter addressed to some prominent person, criticising his opinions or his actions, or putting to him a number of formal questions with the view of receiving a published reply. This is usually called an **open letter**.

PARTS OF A LETTER.

The parts of a letter are the **heading**, the **address**, the **salutation**, the **body**, the **complimentary close**, and the **signature**.

42 Hollis St.

Newton, Mass., Aug. 16, 1893.

Mr. John Adair,

Toronto, Ont.

*My dear Sir:—I have this day received your
favor enclosing a copy of the etc.*

This form indicates a **good style** for beginning an ordinary business letter. Bring the "My dear Sir," over to the left so that it will be flush with the "Mr." and the left end of the second line. This is the **most approved form**, and it is certainly the neatest. See that your address at the top is full and complete.

Write the street, or the P. O. Box, or whatever supplemental address is necessary, just above the name of your post office. If your business letter is to a **married woman**, say "My dear Madam" instead of "My dear Sir." If you are well acquainted with the man, drop the name and address, and write simply, "Dear Mr. Adair," or if a woman, write "Dear Mrs. Brown." If he is younger than you, either in years or experience, or even if he is on equality and is a warm friend, you might begin "My dear Mr. Adair." Note that when written this way "dear" is not written with a capital. If you are addressing a business letter to a **young lady** whom you do not know, simply write "Miss Kate Stevenson," and begin your letter without any further introduction. If you are acquainted, either formally, or if your names are familiar one to the other, you may write "Dear Miss Stevenson." Of course when written in this way there is no other part to the salutation as in the business letter addressed to "John Adair," when his address is given. **Friendly letters** to men or boys may begin "My dear Charley" or "My dear Brown." The old forms "Kind friend" or "Dear friend" are a good deal out of date. If you are addressing a business letter to a firm, write "Gentlemen" instead of "My dear Sir." Never use the vulgar contraction "Gents." **Neatness and correctness** are essential in all correspondence. There is no excuse for a carelessly written letter.

There are towns and cities in different States and Provinces which have **the same name**. In writing from any such, even though it be a large and well-known place, be careful to add the name of the State or Province. Better put your **street and number** on every letter. Your correspondent does not want to spend an hour looking for an old letter containing your address. **Don't crowd** your letter. Leave a good inch at the top of the sheet perfectly blank.

Titles should not be omitted, but they should be used sparingly. "Mr." is good enough for anybody from the President down. Never put on a title at each end or more than one at either end. Clergymen may be addressed "Rev." and physicians "Dr.," but even this formality is hardly necessary.

The salutation of letters addressed to **public officers** should be quite formal if the letters relate to public affairs. In such letters the address is usually put at the close.

Keep the margins of your letter even. Don't make many **paragraphs**. When a new paragraph is necessary, it should begin directly on a line with the first

word of the body of the letter. Learn to write straight on **unruled paper**.

The **complimentary close** follows the body of the letter, and immediately precedes the signature. The closing words should not be more familiar than the salutation, and, like the words of the salutation,

Pardon me for referring to this subject a second time, and believe me,

Your true friend,

JERROLD BALL.

they depend upon the relation between the two persons. "*Respectfully yours*," "*Very truly yours*," "*Yours cordially*," etc., are the usual closing words of formal correspondence. Letters of friendship admit of less formal terms. The **first word only** of the complimentary close should begin with a capital.

Write your **signature plainly**. Your friends may be very familiar with your dashing ink lines, but the man who sees the name for the first time may have considerable difficulty in transforming it correctly into readable script.

THREE IMPORTANT NOTES.

Instant. The abbreviated form is *inst.* In correspondence this word means *present month*.

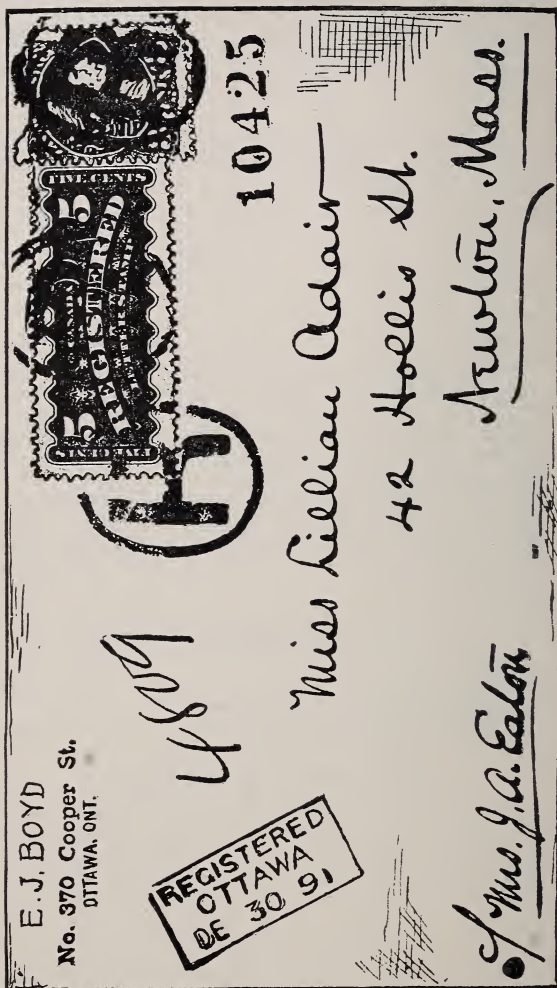
Ultimo. The abbreviated form is *ulto* or *ult.* In correspondence this Latin word means *the month last past*.

Proximo. The abbreviated form is *prox.* In correspondence this Latin word means *next or coming month*.

THE ENVELOPE ADDRESS.

Thirty thousand misdirected letters reach the dead letter office at Washington daily. The public need to be educated along this line. In addressing an envelope write first the name, then the postoffice, then the state. If additional matter, such as street, or box, or county, is necessary, put it at the lower left hand corner. Even in the case of large cities, it is necessary to write the name of the state, for there are in the United States, five New Yorks, nine Philadelphias, and twelve Bostons. Be particularly careful in writing the abbreviations of states. Thus N.Y. may easily be taken for N.J.; Pa. for Va.; Cal. for Col.; Md. for Ind.; Me. for Mo. Mail intended for people who will

be in a place only a day or two should have "transient" added to the address to distinguish from permanent



residents. Write in the upper left-hand corner and enclose in brackets. Always put the stamp in the upper right-hand corner. Letters to be registered must have the name and address of the sender on the envelope.

BUSINESS

HOW
TO DO

Be **honest and square** in all your dealings.

It makes little difference about the nature of the enterprise, so long as it is legitimate, its success or failure depends largely upon the **personal industry** and attention of its owner.

Business will **not run itself**, neither will it run by simply turning a crank.

Exercise **common-sense** economy, and cut off needless expenditure.

Success of the lasting sort, the kind that has good staying qualities, does not usually come in a day. If you would reach the front and stay there, first carefully choose your business, or occupation, and then concentrate your forces on that one thing. Don't expect big results at once. **Be patient, wait, work, stick.**

Do not be loose, careless, disorderly. The successful man has a **time and place for everything**. He is master of his business and does not allow it to master him.

Don't be too eager **to get rich**. Better adopt and follow the slower but surer methods.

To be successful in business, a man must have not only capital and favorable surroundings, but the training which is the result of **experience**.

Agreements and contracts should be in **writing**. Don't trust to your memory. Keep your accounts in perfect condition.

In this age, and especially in this country, the word is **push**. The mere plodder is left far behind. It isn't enough to pound the iron when it is hot; you must pound it till you make it hot.

Three **changes** in business equal a fire. It is as true to-day as ever that "a rolling stone gathers no moss."

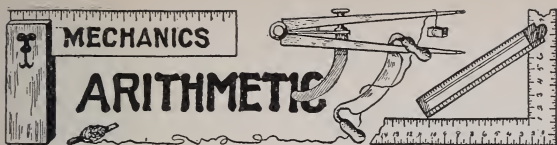
Success should come at the **right end**. An immense success at the outset is almost sure failure farther on.

Be **self-reliant**. Do not be a mere imitator. We grow strong by expending our strength in manly conflict with the obstacles which confront us. "The gods help those who help themselves."

Select work for which you are fitted, learn it thoroughly, and entertain no thought of changing. Put forth your best efforts all the time. Respect yourself too much to hold your calling unworthy, bearing in mind the fact that the work is most honorable which is best done.

The **ambition to succeed** may be and always ought to be a laudable one. It is emphatically an American ambition; at once the national vice and the national virtue. It is the main-spring of activity; the driving-wheel of industry; the spur to intellectual and moral progress. It gives the individual energy; the nation push. It makes the difference between the people that are a stream and the people that are a pool; between America and China. It makes us at once active and restless; industrious and overworked; generous and greedy. When it is great, it is a virtue; when it is petty, it is a vice. A petty ambition achieves the emblems and tokens of success; a great ambition is the ambition to do and to be.

Success is not fees, nor office, nor salary, nor land, nor goods, nor machinery: it is **results obtained**; harvests reaped, garnered, distributed; humanity bettered; the nation improved; the world enriched. Every man who leaves his home, his village, his country **better for his thoughts and deeds** has succeeded; every man who has not, has failed.



NOTES AND DEFINITIONS.

A **straight line** is a line which does not change in its direction.

Parallel lines are lines which always remain the same distance from each other, however far they may be produced.

The opening between two straight lines drawn from the same point is called an **angle**.

When two straight lines cross each other so as to form four equal angles, the angles are called **right angles**.

An angle greater than a right angle is called an **obtuse angle**, and an angle less than a right angle is called an **acute angle**.

A **surface** has length and breadth without thickness. A *plane* surface is a *level* surface. The amount of space over which a surface extends is called its **area**.

A surface bounded by four straight lines, and having four right angles, is called a **rectangle**.

A *rectangle* is called a **square** when its four sides are equal.

The line joining two opposite corners of a square or rectangle is called the **diagonal**.

A plane figure bounded by three straight lines is a **triangle**. The **base** of a triangle is the side on which it is supposed to rest.

The **altitude** of a triangle is the perpendicular distance from the angle opposite the base to the base, or to the base produced.

A four-sided plane figure having no two sides parallel is called a **trapezium**.

The **perimeter** of a plane figure is the sum of its sides.

A **circle** is a plane figure bounded by a curved line, every point of which is equally distant from a point within, called the **centre**. The boundary line is called the **circumference**. A straight line drawn through the centre and terminating at the circumference on both sides is called a **diameter**. A straight line drawn from the centre to the circumference is called a **radius**.

A **solid** has length, breadth, and thickness, or height. A cube is a solid figure contained by six equal squares. A **rectangular solid** is a solid figure contained by six angular surfaces.

The volume of a rectangular solid is the portion of space which it occupies.

A solid bounded by a curved surface, every point of which is equally distant from a point within, called the centre, is called a globe, or sphere.

A cylinder is a solid figure described by the revolution of a rectangle about one of its sides, which remains fixed. An uncut lead-pencil is an example.

MEASUREMENT TABLES.

Linear measure is used in measuring lengths and distances. The table is as follows :

12 inches	=	1 foot	<i>ft.</i>
3 feet	=	1 yard	<i>yd.</i>
5½ yards (16½ feet)	=	1 rod	<i>rd.</i>
320 rods	=	1 mile	<i>mi.</i>

Remember that 1 mile equals 1,760 yards.

Surveyors' lineal measure is used by surveyors in measuring land and distances. The table is as follows :

7.92 inches	=	1 link	<i>l.</i>
25 links	=	1 rod	<i>rd.</i>
100 links (4 rods) . . .	=	1 chain	<i>ch.</i>
80 chains	=	1 mile	<i>mi.</i>

Remember that a chain equals 66 feet or 4 rods.

Surface measure is used in measuring surfaces. The table is as follows :

144 square inches . . .	=	1 square foot . . .	<i>sq. ft.</i>
9 square feet	=	1 square yard . . .	<i>sq. yd.</i>
30¼ square yards . . .	=	1 square rod	<i>sq. rd.</i>
160 square rods	=	1 acre	<i>A.</i>
640 acres	=	1 square mile . . .	<i>sq. mi.</i>

A square measuring 208.71+ feet on each side contains 1 acre.

Surveyors' square measure is used by surveyors in computing the area of land. The table is as follows :

625 square links . . .	=	1 square rod . . .	<i>sq. rd.</i>
16 square rods	=	1 square chain. . .	<i>sq. ch.</i>
10 square chains . . .	=	1 acre	<i>A.</i>

An acre equals 4,840 square yards.

Cubic measure is used to measure the contents or volume of solids. The table is as follows:

1728 cubic inches	. . =	1 cubic foot	. cu. ft.
27 cubic feet	. . . =	1 cubic yard	. cu. yd.
128 cubic feet	. . . =	1 cord	. . . cd.

MEASUREMENT OF RECTANGULAR PLANES.

The **area** of any rectangle is expressed by the product of the length and the breadth. Before multiplying it is necessary that both dimensions be expressed in units of the same denomination.

In the same manner, if a **rectangle** be 4 feet long and 3 feet broad, its area is 12 *square feet*; that is, the rectangle might be divided into 12 equal figures, each being a foot long and a foot broad.

MEASUREMENT OF RECTANGULAR SOLIDS.

The **volume** of a rectangular solid is expressed by the product of the length, breadth, and height, when the three dimensions are expressed in units of the same denomination.

To **measure** a solid block, or to find how much a box, a bin, or a cellar will contain, we have to ascertain, by actual measurement, its length, breadth, and depth, and with these three dimensions find the volume by simple multiplication. Thus, if we desire to find the number of cubic yards of earth removed in digging a cellar 40 feet long, 18 feet wide, and 10 feet deep, we multiply 40, 18, and 10 together, and get 7,200 feet, or $266\frac{2}{3}$ cubic yards.

MEASUREMENT OF WOOD.

Wood cut in lengths of 4 feet is called **cord wood**. A pile of cord wood 4 feet high and 8 feet long, or equal bulk of other material, is called a **cord**.

Thus a cord of wood is 8 feet by 4 feet by 4 feet, and contains 128 cubic feet. To find the number of cords in a pile of wood or bark piled in the form of a rectangular solid, find its solid contents or volume in cubic feet, and divide the result by 128.

MEASUREMENT OF LUMBER.

Lumber, as the term is used here, includes all kinds of sawed boards, planks, scantlings, etc.

A **foot of lumber** is 1 foot long, 1 foot wide, and 1 inch thick, and is used as the unit of lumber measurement.

The term **scantling** is given to lumber 3 or 4 inches wide, and from 2 to 4 inches thick. **Joist** is usually narrow and deep. Lumber heavier than joist or scantling is called **timber**. Thick boards are called **planks**. The usual outside covering of wood houses is **siding**.

All lumber less than 1 inch in thickness is considered inch lumber in measuring.

In measuring the width of a board a fraction greater than a half-inch is called an inch, and if less than a half it is rejected. A board $5\frac{7}{8}$ inches wide would be considered 6 inches wide.

The **price of lumber** is usually quoted at a certain rate per thousand feet.

A board 14 feet long, 12 inches wide, and 1 inch in thickness would contain $(14 \times 12 \times 1) \div 12$, or 14 feet. A board 10 feet long, 16 inches wide, and 3 inches thick, would contain $(10 \times 16 \times 3) \div 12$, or 40 feet. Note that in measuring 12-foot lumber, 1 inch or less in thickness, the width of the board in inches is the number of feet it contains.

MEASUREMENT OF STONE WORK.

A **cord of stone** is the same size as a cord of wood. In estimating stone-work no smaller part than quarter-cords is allowed.

A cord of stone will make about 100 cubic feet of wall.

In estimating the amount of stone or the cost of the mason-work, it is customary to measure around the outside of the wall, and make no allowance for openings except they are large.

Three bushels of lime and a cubic yard of sand will lay a cord of stone.

A **perch** of stone-work is 1 rod long, $1\frac{1}{2}$ feet thick, and 1 foot high: it contains $24\frac{3}{4}$ cubic feet. A fractional part of a perch is reckoned as a perch.

MEASUREMENT OF BRICK-WORK.

Bricks vary so much in size and style that a table of exact dimensions is impracticable. Ordinary bricks are $8\frac{1}{2}$ inches long, 4 inches wide, and $2\frac{1}{2}$ inches high.

It is sufficiently accurate to reckon 20 bricks to the cubic foot laid dry.

In half-brick walls, such as are built in veneering wooden

houses, each brick, with the mortar required to lay it, has an external surface of 3 inches by 9 inches, or a brick is required for each 27 inches of surface.

In **estimating material**, corners are measured once, and allowance is made for doors and windows. In **estimating labor**, the corners are measured twice ; that is, the outside measurement is taken and usually one-half is deducted for openings.

MEASUREMENT OF SHINGLING.

Ordinary **shingles** have an average width of 4 inches, and are generally laid 4 inches to the weather.

A **bunch of shingles** contains a quarter of a thousand. It is 20 inches wide, and has 25 courses on each side.

Allowing for waste, 1,000, or a **square of shingles**, will lay 100 square feet, four inches to the weather.

MEASUREMENT OF LATHING.

A **bunch of laths** contains 50 laths. Laths are 4 feet long, $1\frac{1}{2}$ inches wide, and are laid three-eighths of an inch apart.

Allowing for waste, contractors reckon that a bunch of **laths** will cover 3 square yards.

Lathing is estimated by the square yard. Only one-half the surface of openings is deducted.

MEASUREMENT OF PLASTERING.

Plastering is estimated by the square yard. Only half the surface of openings is charged.

MEASUREMENT OF PAINTING.

Painting and **kalsomining** are estimated by the square yard.

MEASUREMENT OF WALL-PAPER.

Wall-paper is sold only by the roll, any part of a roll being counted as a whole one.

American **paper** is 18 inches wide, and has 24 feet in a single roll, and 48 feet in a double roll.

Paper-hangers measure the distance around the room in feet and deduct 3 feet for each door or window. The difference divided by $1\frac{1}{2}$ gives the number of strips.

The **exact cost** of papering a room can be ascertained only by taking account of the number of rolls actually used in doing the work.

HOW TO FORM A Stock Company—

GENERAL INFORMATION.

Organization. To organize a stock company, the persons interested come together and make a certificate to the effect that they propose to form a corporation to bear a certain name, and that the capital stock is to be a certain amount. This certificate is filed in the office of the Secretary of State, whereupon he issues a License to the persons making such certificate. State laws regarding corporations differ, and concerns find it convenient often to get incorporated under the laws of a State other than the one in which they intend to do business.

Shares. Certificates of stock are issued to each of the subscribers or purchasers. These certificates are transferable at the pleasure of the owners, except when the owners are indebted to the corporation. The capital stock of a company is the sum of all the shares issued, at their par value.

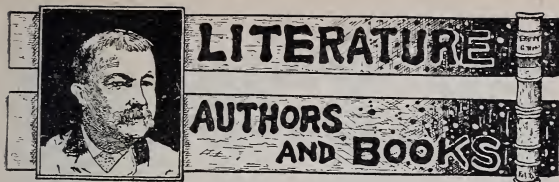
Preferred Stock. The preferred stock of a corporation is given to secure some obligation of the company and upon it dividends are declared in preference to the common stock.

Limited. When the word *limited* is affixed to a stock company's name, it signifies that each shareholder is individually liable to the creditors of the company for only the amount representing the value of shares held by each. When the word *limited* is not attached, it is understood that it is a *full* liability company in which each shareholder is individually liable to the creditors of the company.

Taxes. When the stock of a company is taxed, the company is exempt from taxation on its real and personal property, because the shares represent the company's assets and the State cannot collect twice on the same property.

Reports. Officers of stock companies are required to file with the Secretary of State reports giving particulars as to paid-up capital, assets and liabilities, surplus and dividends.

Laws Differ. Since the laws of the various States differ so widely from each other, persons intending to form a stock company, should first consult the statutes covering "Corporations."



STANDARD ENGLISH AUTHORS.

Geoffrey Chaucer (1340-1400). Called "the father of English poetry." His greatest work is the *Canterbury Tales*. The Anglo-Saxon of his poems is almost unintelligible to modern readers. Dryden calls him "a perpetual fountain of good sense."

Edmund Spenser (1552-1599). A great poet of the sixteenth century. His greatest work is *The Faerie Queene* — an allegory like the "Pilgrim's Progress." He was the oracle of the great poets of the following century.

William Shakespeare (1564-1616). The greatest poet who ever lived. Very little is known of his life. Has written thirty-seven plays and many short poems. The greatest of his tragedies are probably *Hamlet* and *King Lear*; the best of his historical plays, *Richard III* and *Julius Caesar*; and the finest comedies, *Midsummer Night's Dream* and *As You Like It*. He was a master of all human experience, knew the human heart in all its phases, was acquainted with all sorts and conditions of men, familiar with history of all time, and had a greater mastery of language than any other writer who ever lived.

Francis Bacon (1561-1626). A great thinker and prose writer. Called "the wisest, brightest, meanest of mankind." His *Essays* should find a place in every library. No man could say wiser things in pithier words.

John Milton (1608-1674). The greatest epic poet of English literature. Had a government position under Cromwell. His great poems are *Paradise Lost* and *Paradise Regained*. They are much better poetry than theology. For many years Milton was stone blind.

John Dryden (1631-1700). A great poet. For many years he was poet-laureate of England. Many of his most pithy lines are often quoted, such as "Men are but children of a larger growth."

John Bunyan (1628-1688). A famous Baptist preacher, best known as author of the *Pilgrim's Progress*, written while he was serving a term in jail for preaching.

Daniel Defoe (1661-1731). A prose writer whose books have been the delight of many generations. Best known as the author of *Robinson Crusoe*. Said to have written 250 books.

Jonathan Swift (1667-1745). A famous prose writer. Best known as the author of that famous satire on humanity known as *Gulliver's Travels*. As he said he would, he died "first at the top."

Joseph Addison (1672-1719). The most elegant prose writer of the eighteenth century. Famous for his style. His creation of the character of *Sir Roger de Coverley* will live forever.

Alexander Pope (1688-1744). The greatest poet of the eighteenth century. His *Essay on Man* is perhaps his most famous poem.

Thomas Gray (1716-1771). Famous as the author of the beautiful short poem, the *Elegy Written in a Country Churchyard*. Contains 32 stanzas. Took him seven years to write them.

Samuel Johnson (1709-1784). A great essayist and the first lexicographer. One of the most interesting characters in English literature. His memory keeps his works alive, not his works his memory. To say that a style is *Johnsonian* is to intimate that it is loaded down with big words.

Oliver Goldsmith (1728-1774). Poet, essayist, and dramatist. A great man without a rudder. Best poems, *The Deserted Village*, and *The Traveller*. His best play is *She Stoops to Conquer*. A friend of Johnson's.

William Cowper (1731-1800). One of the truest, purest, and sweetest of English poets. Readers are most familiar with *The Task*. "God made the country, man made the town," is one of his famous lines.

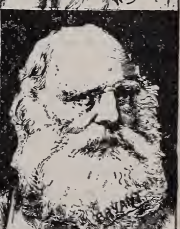
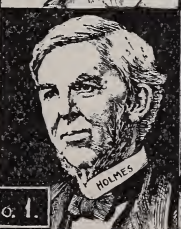
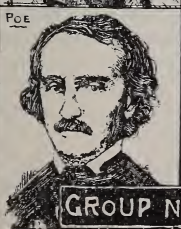
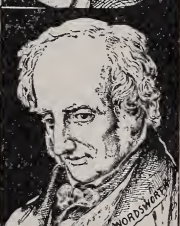
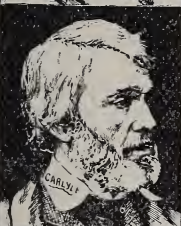
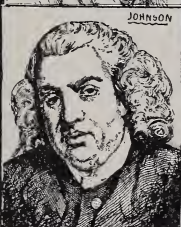
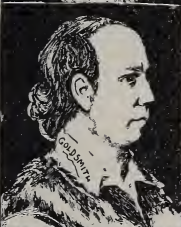
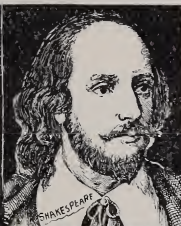
Robert Burns (1759-1796). Great poet of Scotland. Son of poor parents. Early opportunities limited. Many of his songs are famous. One of his finest poems is *The Cotter's Saturday Night*.

William Wordsworth (1770-1850). Poet-laureate after Southey. Famous as a poet of Nature. Among his shorter poems are some of the most beautiful in the language.

Sir Walter Scott (1771-1832). Famous Scotch poet, and ranking with Dickens as one of England's greatest novelists. His poems, *Marmion* and the *Lady of the Lake*, and his novels *Old Mortality*, *Kenilworth* and *Ivanhoe* take first rank. His first novel, *Waverley*, gives the name to the whole series. Scott was lame from youth.

Samuel Taylor Coleridge (1772-1834). A true poet and a writer of noble prose. His *Rime of the Ancient Mariner* and *Christabel* are his best known poems.

Robert Southey (1774-1843). Poet, reviewer, historian. Friend of Coleridge and Wordsworth. Wrote more than 100 volumes. Best known poem, *Joan of Arc*.



GROUP No. 1.

Thomas Moore (1779-1852). A famous Irish poet. It is as a writer of songs that he will live in literature. His best known poem is *Lalla Rookh*.

George Gordon, Lord Byron (1788-1824). A great poet. The only child of an unprincipled father and a passionate mother. He "woke one morning," he said, "and found himself famous," as the author of *Childe Harold's Pilgrimage*. His style is remarkable for its elasticity, tireless energy, and brilliant illustrations. Byron had a club-foot.

Percy Bysshe Shelley (1792-1822). A great lyric poet. His thoughts, his words, and his deeds all sang together. He was drowned in the Mediterranean Sea.

John Keats (1795-1821). A great poet. He has given us lines which will always live, such as "A thing of beauty is a joy forever." Died of consumption when only twenty-five.

Thomas De Quincey (1785-1859). A brilliant essayist. His style is specially stimulating and helpful to young literary students.

Thomas Carlyle (1795-1881). A great thinker, essayist, and historian. His most remarkable book is *The French Revolution*. Many amusing stories are told of his dogged disposition.

Thomas Babington Macaulay (1800-1859). England's greatest historian. Had a wonderful memory. His history is as fascinating as a novel.

Elizabeth Barrett Browning (1809-1861). A famous poet. Wife of Robert Browning. *Aurora Leigh* is considered her best poem. Her sonnets and lyrics are full of pathos and passion.

Robert Browning (1812-1888). The most original poet of the century. His language is always very hard to understand. For fullness of thought and experience his poems rank next to those of Shakespeare.

William Makepeace Thackeray (1811-1863). A great English novelist. His novel, *Vanity Fair*, takes rank with the greatest novels in the language.

Charles Dickens (1812-1870). A great English novelist. His characters in *Pickwick*, *Nicholas Nickleby*, *Oliver Twist*, and *David Copperfield* will live as long as the language lasts. No author comes so close to the great heart of humanity. The spirit of all his work is the spirit of love — the hatred of evil and the love of good.

John Ruskin (1819-—). A great essayist, art-critic and thinker. His writings are full of the wisest sayings put into the most musical and beautiful language.

George Eliot (1819-1881). A great novelist. Her real name was Marian Evans. Her most popular novels are *Adam Bede*, *Romola* and *Middlemarch*.

John Tyndall (1820- —). A great English scientist, and a vigorous and fascinating writer. Best known as an explorer in experimental physics.

Thomas Henry Huxley (1825- —). A great English scientist. An important contributor to the recent discussion of the origin of man. An able supporter of Darwin's evolutionary doctrines.

Alfred Tennyson (1810- —). The first of living poets. Succeeded Wordsworth as poet-laureate. The charm of his poetry lies mainly in his felicity of diction, and in his choice and arrangement of words.

Other Famous English Authors — Jane Austen, Jane Porter, Thomas Campbell, Leigh Hunt, Michael Faraday, Frederick Marryatt, Felicia Hemens, Samuel Lover, Hugh Miller, Benjamin Disraeli, John Stuart Mill, Charles Darwin, Charles Mackay, Charles Reade, Anthony Trollope, Charles Kingsley, Herbert Spencer, Matthew Arnold, Thomas Hughes, Max Muller, Charlotte M. Yonge, Charlotte Bronte, Wilkie Collins, George MacDonald, Dinah Maria Craik, George Meredith, Sir Edwin Arnold, Mary E. Braddon, Algernon Swinburne, William Black, Robert Louis Stevenson, Rider Haggard.

STANDARD AMERICAN AUTHORS.

Benjamin Franklin (1706-1790). A characteristic figure of his time. A man of wonderful resources. In his inventiveness, thrift, common-sense and practicality he started out as the primal Yankee.

Washington Irving (1783-1859). A great essayist and novelist. His *Sketch Book* contains the celebrated story of "Rip Van Winkle." Buried at Sleepy Hollow near Tarrytown on the Hudson.

James Fennimore Cooper (1789-1851). Popular novelist. Some of his best known stories are *The Spy*, *The Last of the Mohicans*, and *The Pilot*.

Edgar Allan Poe (1809-1849). A sad figure in American literature. Most of his stories have weird, ghostly, unnatural plots. *The Raven* is his most famous poem.

George Bancroft (1800-1891). America's greatest historian.

Harriet Beecher Stowe (1812- —). Famous as the author of *Uncle Tom's Cabin*. Sister of Henry Ward Beecher. Wrote several popular novels describing New England life and character.

William Cullen Bryant (1794-1878). Famous poet. His best known poem is *Thanatopsis*, written when he was only eighteen years of age.

Henry Wadsworth Longfellow (1807-1882). The most famous figure in American literature, and one of the most popular poets of all time. His best known poems are *Evangeline* and *Hiawatha*. Longfellow is buried at Mt. Auburn near Boston.

Ralph Waldo Emerson (1803-1882). Famous author and philosopher. Imparted extraordinary stimulus to pure living and high-thinking. He was a rare type of innocence. He stands as one of the few great original forces in literature.

Henry David Thoreau (1817-1862). Wrote poems and essays. Lived for some time in a hut on Lake Walden near Concord, Mass.

Nathaniel Hawthorne (1804-1864). One of America's best known writers. His novels, "The Scarlet Letter," "Twice-Told Tales," "The House of the Seven Gables," and "The Marble Faun," are familiar to all students of literature.

Oliver Wendell Holmes (1809- ———). Began active life as a physician. Called "The Autocrat," from the use of this title to his department in the *Atlantic Monthly*. His novels, "Elsie Venner" and "The Guardian Angel," are delightful reading.

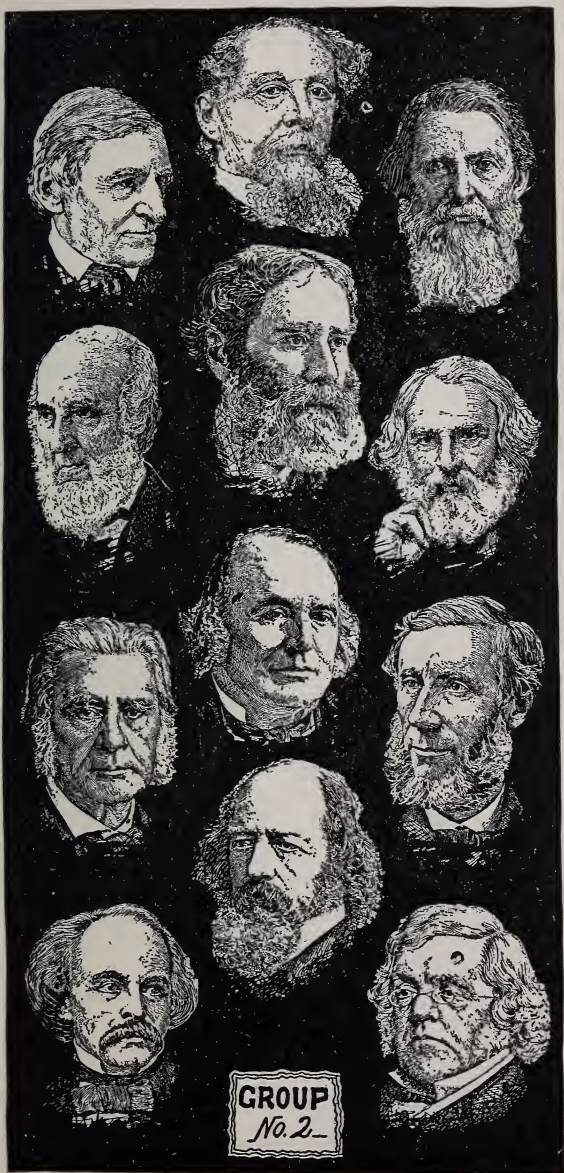
James Russell Lowell (1819-1891). Poet and prose writer. In later years, a famous essayist. Made famous by the *Biglow Papers*.

John Greenleaf Whittier (1807-1892). The Quaker poet. Abolitionist. *Snow-Bound* is one of his most beautiful poems. Whittier never married.

Other Famous American Authors.

Louisa M. Alcott, T. B. Aldrich, W. H. Bishop, H. H. Boyesen, H. C. Bunner, "Bob Burdette," John Burroughs, George W. Cable, Alice and Phœbe Cary, Samuel L. Clemens (Mark Twain), Rose Terry Cooke, George William Curtis, Edward Eggleston, Augusta J. Evans, Edgar Fawcett, Eugene Field, John Fiske, William Hamilton Gibson, Richard W. Gilder, J. R. Gilmore, John Habberton, Edward Everett Hale, Joel Chandler Harris, Francis Bret Harte, Julian Hawthorne, Paul Hayne, Thos. Wentworth Higginson, J. G. Holland, F. Hopkinson Smith, E. W. Howe, W. D. Howells, Mrs. H. H. Jackson, Henry James, Sarah Orne Jewett, Richard Malcolm Johnston, George Parsons Lathrop, Brander Matthews, Joaquin Miller, Donald G. Mitchell, J. L. Motley, E. W. (Bill) Nye, Thos. Nelson Page, Francis Parkman, James Parton, J. H. Payne, Elizabeth Stuart Phelps-Ward, Wendell Phillips, James Whitcomb Riley, Amelie Rives, E. P. Roe, Edgar Saltus, Jno. G. Saxe, Mrs. E. D. E. N. Southworth, Harriet Prescott Spofford, Edmund Clarence Stedman, Frank R. Stockton, R. H. Stoddard, Bayard Taylor, Celia Thaxter, Lew Wallace, Charles Dudley Warner, E. P. Whipple, Richard Grant White, Constance Fennimore Woolson, John Boyle O'Reilly.

NOTE.—Group No. 2 includes the following authors: Emerson, Dickens, Ruskin — Whittier, Lowell, Longfellow — Huxley, Agassiz, Tyndal — Hawthorne, Tennyson, Thackeray.



A. Pope
N.Y. N.H. Shakspeare & Bacon

Milton Jon: Dryden.

John Milton / Jon: Dryden.
" B. Franklin

John Johnson

J. H. Lowell.

Franklin

Wm Cowper

Winnipeg

Oliver Holt
Walker Hall
B.

Wm Lloyd Garrison To
Uncle Sam Worth

Robert

Thomas Carlyle

Robert Burns

Charlotte Kess

W. C. Bryant
MS.

M. W. L.

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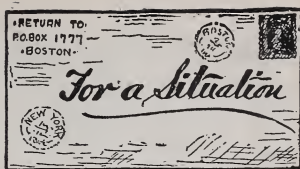
more

Lynnda
Cooper



LITERARY

J. Fenimore Cooper



HELPFUL HINTS.

Be good for something. No use applying for a situation if you cannot do anything. Encourage and develop **some one** talent for the use of which the world offers a money value. The man who can do almost anything fairly well isn't drawing half the salary of the man who can do one thing better than other people.

Never be idle. If you are out of work and can't find any, go and help some poor fellow who has more than he can carry. Don't consider that you are doing him a great favor, either. He is really doing you the favor. For every one man who can't find work, there are five who have more than they can do. If you read your Bible you will find that the men whom God put to work were not standing around with their hands in their pockets waiting for a job.

Never despair. You can do almost anything you make up your mind to do, and resolve upon doing, willingly and earnestly. Do not be afraid of pounding persistently at one thing, even if people do call you a crank.

Get at something. If nothing turns up, turn something up. The man who is at work has ten chances to get a better place, for one chance the man who is out of work has to get anything to do. If the place isn't good enough or the pay not big enough, fill the place chuck full, so that you bulge over a little where people can see you, and earn every cent of the pay. The people who are most tired in this world are working for themselves. It may rest you to help another fellow.

Don't quit a good position until you are sure of a better one. Remember that the very best positions are secured through promotions and not by answering advertisements. The boys who are always looking for nice, easy positions at fat salaries, never get them.

Don't try everything. The applicant who answers all advertisements and claims ability to fill each position, will stand a poor chance to get an appointment. If you are satisfied that you can fill the requirements, put forth your best facts to prove it.

Don't tell your history. It will not be necessary to say how well bred or how well educated you are. Show this by the moderation of your statements, the conciseness of your facts, by correct spelling and good grammar, by a neat and respectable letter. Write such a letter as will obtain for you an interview, and your manners can then be made manifest.

Use good stationery — not that of your present employer. The longer you have been with one house the more valuable you will appear to a new one. Don't enclose postage stamps for reply. It is a useless expense. If your letter is the one chosen, the advertiser will spend two cents to see you. Use the ordinary-shaped business envelope. All fancy stationery goes into the waste-basket without being opened.

Be frank and sincere. Don't waste your time and the advertiser's by applying for a position which you are unable to fill. An office-boy cannot expect to get a job as business manager of a large corporation, and a young man of twenty-five, no matter how smart he may be, will not be chosen as a bank president.

SAMPLE APPLICATION.

225 Main St.

Boston, Aug. 17, 1892.

Messrs. A. R. Stone & Co.,
Salem, Mass.

Gentlemen : — In reply to your advertisement in today's "Herald" for a salesman and office assistant, I beg to offer my services. I was in the employ of the well-known firm of R. M. Hamilton & Co. of this city, for five years, ending June last, when they sold out. I had the third position in their counting-room, where I had considerable experience in bookkeeping and correspondence. I have not had any experience as salesman, but if my application proves successful, I shall try to give satisfaction. I enclose such testimonials as I have convenient, and shall await, with some interest, your reply.

Yours very respectfully,

MAXWELL EATON.



There are a great many methods of secret writing. Most governments have a private cipher for telegraphic messages to their foreign representatives. This is a very necessary provision in times of political disturbance. Here is a cipher alphabet which may be found interesting :

1	2	3	4	5	6	7	8	9	0
A	B	C	D	E	F	G	H	I	AND
~~1~~	~~2~~	~~3~~	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~	~~9~~	~~0~~
J	K	L	M	N	O	P	Q	R	THE
1	2	3	4	5	6	7	8	9	0
S	T	U	V	W	X	Y	Z	to	of

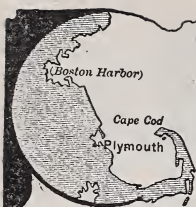
By a little study one can very easily commit this alphabet to memory. Try the following exercises :

81997 0 9 5933 25 12 0

86458 7192 2/30 689417.

5933 763 295437 2533 4911 2.

26 3133 668 718353 12 5678511.



"MAYFLOWER"

Passenger List

1620

HEADS of FAMILIES.

John Carver —

William Bradford

Edward Winslow —

William Brewster

Isaac Allerton

Miles Standish

John Alden —

Samuel Fisher

Christopher Martin

William Mullins

William White

Richard Warren

John Howland

Stephen Hopkins

Edward Tilley

John Tilley

Francis Cook

Thomas Rogers

Thomas Tinker

John Rigdale

Edward Fuller

John Turner



Francis Eaton

James Chilton

John Crackstone

John Billington

Moses Fletcher

John Goodman

Digory Priest

Thomas Williams

Gilbert Winslow

Edmund Margeson

Peter Brown

Richard Britteridge

George Soule

Richard Clark

Richard Gardiner

John Allerton

Thomas English

Edward Doten

Edward Leister

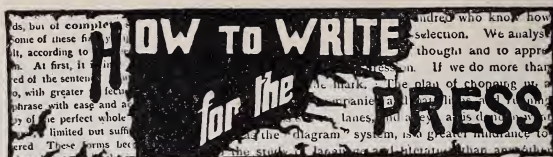


Pine-Tree Shilling.

William Bradford

Myles Standish





OPINIONS OF SUCCESSFUL AUTHORS.

Mrs. Craik. I believe composition is a gift, not an art,—impossible to teach, though it may be improved by study. Say what you have to say as briefly and simply as you can. Be your own natural self.

Jean Ingelow. Cultivate your mind and let your style alone. Study our best writers—what they said and how they said it.

Louise Chandler Moulton. I think one cannot acquire a good style unless one has the natural gift, as one must have an ear for music. Then this gift must be cultivated by the careful and constant reading of the best masters. Any one can use words *correctly*, but to use them forcibly, picturesquely, is another thing.

James Russell Lowell. I am inclined to think that a man's style is born with him, and that a style modelled upon another's is apt to be none or worse. Of course I mean consciously modelled, for frequent commerce with the best writers is essential.

Julian Hawthorne. Literary style is largely a matter of innate aptitude, and is fostered as much by the study of good authors as by personal efforts. Neither cause will produce a good style without the other. The best writing is always the most spontaneous and easy.

George Macdonald. I would say to any one whose heart burned within him, write freely what you feel, and then correct rigorously. The truth must give you your material and utterance.

Amelia E. Barr. I put myself, my experiences, my observations, my heart and soul into my work. I live as close as I can to God and as far away from the world as possible.

Lew Wallace. If there is excellence in my composition, set it down, first of all things and last, to the fact that I have no method. Modes of expression in writing, like modes of expression in speech, are referable to feeling.

Elizabeth Stuart Phelps-Ward. So far as the formation of my own style goes, it is the result of downright hard work. This and the experience of life, have been my chief teachers.

Bret Harte. I formed my style in a printing-office in a country where people live by observation rather than tradition, and the routine was not without a certain chastening effect on both writer and reader.

Mark Twain. I am not sure that I have methods in composition. If I have, they begot themselves, in which case I am only their proprietor, not their father.

Celia Thaxter. One or two rules I laid down: never to use more words than I could help to give my full meaning; never to speak a sentence that was not as crystal clear as I could make it.

Ernest Renan. To write well is to think well; there is no art of style distinct from the culture of the mind. The good writer is a complete mine, gifted with judgment, passion, imagination, and at the same time, well trained. Instruction, wealth of information, fulness of knowledge, are acquired. Thus good training of the mind is the only school of good style.

George Meredith. Writing is an art as painting is, and in both we must begin by reverent study of the masters.

George William Curtis. Every young writer should remember that bigness is not greatness, nor fury, force.

Phillips Brooks. My only training in composition has been the constant effort for many years to say as clearly and forcibly as I could what was in my mind.

Oliver Wendell Holmes. You will find it a safe rule, never to write except when you have something worth saying, and then to say it simply.

Thomas Hughes. Any style is good if you have something you have a call to say, and men ought to hear; and no style is good if you haven't.

John Burroughs. Earnestness is the great secret of forcible composition. Unless the idea is plain and palpable, as real in the print, as are the trees in the field or the men in the street, the work is faulty.

W. Clark Russell. My advice to a young beginner would be, first take the trouble to thoroughly understand what you propose to convey and the words will follow. I sometimes wish, indeed, that there was less style and more understanding.

Brander Matthews. To a beginner, the advice I would give would be to think straight and write simply. To be clear is the first duty of a writer; to charm and to please are graces to be acquired later.



INTRODUCTORY NOTE.

New York has no more entertaining public exhibition than its Stock Exchange. It is one of the show-places of the city. The visitor who, for the first time, looks down from a gallery upon its members in the act of transacting business, is astonished at the apparent confusion he witnesses. There is no reason why bonds and shares should not be publicly dealt in, and in large quantities, as well as dry-goods, corn, or cotton. But, unfortunately, few stock exchanges confine their transactions to ordinary legitimate business. The members are divided into two classes — those who execute commissions for others, and those who deal on their own account. Among the latter are the boldest and sharpest speculators of the day. The exchange does not put on its list all prominent stocks and bonds of acknowledged value, impartially selected, and solely because of their merits. You will look in vain for the stock of dozens of corporations whose securities are among the choicest investments. The reason is very evident. The largest profits (to the speculator) are most often made out of the most abominable rubbish. It is upon fluctuations that stock speculation fattens. Quick changes bring quick profits. Wall street does not produce a dollar. It creates nothing. It draws its sustenance entirely from outsiders. The fact that, by putting up one thousand dollars in cash, you can buy twenty thousand dollars in stocks, and take a profit on the larger amount, is to many an irresistible temptation. To those who are anxious to try “stocks,” we say go carefully. Better to *earn* money than to *make* it.

HINTS AND SUGGESTIONS.

Stock Certificate. A stock certificate is a written or a printed instrument of a stock company or corporation, signed by the officers of the company, certifying that the holder of the certificates is the owner of a certain number of shares of its capital stock.

Preferred Stock. The preferred stock is given to secure some obligation of the company and upon it dividends are declared in preference to the common stock.

Watered Stock is issued to stockholders in addition to what they own, and for which no extra pay-

ment is required. When the charter of a corporation or the general law governing corporations, forbids them to declare dividends in excess of a certain *per cent*, or when the stock-holders wish to keep the public in ignorance of their prosperity, watered stock is issued and dividends are declared on the inflated basis. Thus, if a company can pay 16 per cent, but is compelled by law to pay only 8 per cent, its board of managers may water the stock giving to each stockholder one additional share for every share he now has; 16% on \$100 will be only 8% on \$200, and the requirements of the law are satisfied.

Dividends. The dividends are the quarterly, half-yearly, or annual profits which are divided among the shareholders.

Bucket Shop. An establishment conducted nominally for the transaction of a stock-exchange business, but really for the registration of bets or wagers, usually for small amounts, on the rise or fall of the prices of stocks, grain, etc., there being no transfer or delivery of the commodities nominally dealt in. **Puts** and **calls** and bucket shop operations are usually classed as gambling transactions.

Margins. The speculator usually trades on margins; that is, if he has \$500 to invest he buys \$5000 worth of stock, his \$500 being ten per cent of the total amount. He expects to sell again before the remaining \$4500 falls due. If he goes to a reputable broker to buy or sell on a margin, he will be informed that his ten per cent must be kept good. That is, if the stock declines while being carried by the broker, more deposit is necessary.

Bulls and Bears. The term *bull* is applied to those who are purchasers of stock for long account, with the purpose of advancing prices as the tendency of a bull is to elevate everything within its reach. The term *bear* is applied to those who sell stock short, with the purpose of depreciating values. The bear operates for a decline in prices.

HOW TO TRADE.

Select an **honest broker**. The man who buys and sells stocks with profits must base this buying and selling on exact calculations. Every known fact must come into consideration. The speculator who trusts to chance cannot expect to be successful. Facts are easily obtained by the intelligent reader and observer. Common-sense, logic, quickness, courage, knowledge, and capital are the essentials. Through a broker, you can buy and sell all the leading stocks dealt in at the great commercial centres.

Famous —
Autographs

Read them!

John D. Rockefeller
John D. Rockefeller
John D. Rockefeller
John D. Rockefeller

John D. Rockefeller

Bookwriters

Richard Wright.

Dee Brown

Edgar Allan Poe

~~Walter Crane~~

Walter Crane

David Livingstone

Walter Crane



UNITED STATES HISTORY.

1492. The West Indies were discovered by Columbus.
1497. North America was discovered by the Cabots.
1513. Florida was discovered by Ponce de Leon.
The Pacific Ocean was discovered by Balboa.
1521. Mexico was conquered by Cortez.
1534. The St. Lawrence River was discovered by Cartier.
1541. The Mississippi was discovered by De Soto.
1562. The Huguenots began a colony in Carolina.
1565. St. Augustine was settled by the Spaniards.
1579. Drake sailed to the Pacific and made a landing in California.
1584. The coast of North Carolina was explored by Raleigh's expedition and, next year, a second expedition, followed by a third, two years later, made unsuccessful attempts to establish a colony.
1606. The English king, James I., divided his domains in America in two parts, giving one to the London Company and the other to the Plymouth Company.
1607. Jamestown, Va., was settled by the London Company.
1609. The Hudson River was discovered by Henry Hudson.
1614. New York was settled by the Dutch.
1619. Negro slavery was introduced into Virginia.
1620. The Pilgrims landed at Plymouth.
1622. The first Indian massacre in Virginia occurred.
1623. New Hampshire was settled.
The Dutch began to colonize New York.
1633. The first colony of Connecticut was planted at Windsor.
1634. Maryland was settled at St. Mary's.

1636. Roger Williams began the settlement of Rhode Island.
1638. Delaware was settled by the Swedes.
1656. The "Quaker Persecution" in Massachusetts occurred.



1670. South Carolina was settled on the Ashley River.
1673. Marquette descended the Mississippi.
1675. King Philip's War occurred in New England.

- 1682. Pennsylvania was settled by the English.
 Delaware was granted to William Penn.
 La Salle descended the Mississippi.
- 1689. King William's War began in America.
 - 1690. Port Royal, Nova Scotia, was captured by the English.
 - 1692. Plymouth was united with Massachusetts and the Salem Witchcraft delusion prevailed.
 - 1697. The treaty of Ryswick ended King William's War.
- 1702. Queen Anne's War began in America.
 - 1710. Port Royal, N.S., was captured by the English.
 - 1713. The treaty of Utrecht ended Queen Anne's War.
- 1732. Washington was born in Virginia, February 22.
- 1733. Georgia was settled at Savannah.
- 1754. The French and Indian War began.
 - Washington defeated the French at the Great Meadows but capitulated to them at Fort Necessity.
 - 1755. The French were expelled from Nova Scotia and Braddock was defeated at the Monongahela.
 - 1756. Oswego was captured by the French.
 - 1757. Fort William Henry was surrendered to the French.
 - 1758. Abercromby was defeated at Ticonderoga. Louisburg and Fort Frontenac (Kingston) were taken by the English.
 - 1759. Fort Niagara was taken by the English; Wolfe was defeated at the battle of the Montmorenci, but he defeating Montcalm before Quebec, the city surrendered to the English.
 - 1760. Though the English were defeated in a battle near Quebec, Montreal and the rest of Canada were surrendered to them.
- 1763. The treaty of Paris ending the French and Indian War, left England in possession of the region north and south of the St. Lawrence and east of the Mississippi.
- 1765. Parliament passed the Stamp Act.
- 1767. Parliament passed bill taxing tea, glass, etc.
 - 1768. British troops arrived in Boston.
 - 1770. The Boston massacre occurred.
 - 1770. Parliament abolished all taxes except tea tax.
 - 1773. The tea for Boston thrown into the harbor.
 - 1774. Parliament passed the Boston Port Bill.

1774. The first Continental Congress met in Phila.
1775. The War began with the Battle of Lexington.
Washington was elected to command the armies.
The Battle of Bunker Hill was fought June 17.
Montreal surrendered to Montgomery.



Montgomery was defeated and slain at Quebec.

1776. Boston was evacuated by the British.

1776. The British were defeated at Fort Moultrie.
The Declaration of Independence was adopted.
Battle of Trenton — British were defeated.

1777. Battle of Princeton — British were defeated.
Ticonderoga was taken by Burgoyne.
Battle of Bennington — British were defeated.
Battle of Brandywine — Americans were defeated.
Battle of Bemis Heights — first of Stillwater.
Battle of Germantown — Americans were defeated.
Battle of Saratoga or second of Stillwater.
Surrender of Burgoyne.
Washington's army went into quarters at Valley Forge.
1778. France acknowledges Independence of the U.S.
The British army evacuated Philadelphia.
Battle of Monmouth — British retreated.
The Massacre at Wyoming, in Pennsylvania.
The Massacre at Cherry Valley, in New York.
Savannah was captured by the British.
1779. The British were driven from the Northwest.
Battle of Stony Point — British were defeated.
1780. Charleston was surrendered to the British.
Battle of King's Mountain — British were defeated.
1781. Battle of Cowpens — British were defeated.
Articles of Confederation were ratified by the States.
Surrender of Cornwallis at Yorktown.
1783. Definitive Treaty of Peace was signed at Paris.
1787. Constitution of U.S. adopted by Convention.
1789. Eleven States having adopted the Constitution,
Congress decided that it should go into
effect on the 4th of March, 1789.
1789. Washington was inaugurated President.
1793. Whitney invented the Cotton-gin.
1795. Jay's Treaty with Great Britain was ratified.
1797. John Adams was inaugurated President.
1798. Alien and Sedition Laws were enacted.
1799. Washington died at Mount Vernon.
1800. First Meeting of Congress in Washington.
1801. Thomas Jefferson was inaugurated President.
1803. The Louisiana Territory was purchased of
France.
1804. The duel between Hamilton and Burr.
1807. Frigate Leopard attacked Frigate Chesapeake.
Fulton's steamboat Clermont ascended the Hudson.
1809. James Madison was inaugurated President.
1811. Battle of Tippecanoe — Indians defeated.



1812. War was declared against Great Britain.
Hull surrendered Detroit to the British.
Americans were defeated at Queenstown.
1813. British were repulsed at Sackett's Harbor.
1813. Battle of Lake Erie — British defeated.
1814. Battle of Chippewa — British defeated.
1814. Battle of Lundy Lane — British defeated.
1814. British burn public buildings in Washington.
Battle of Lake Champlain — British defeated.

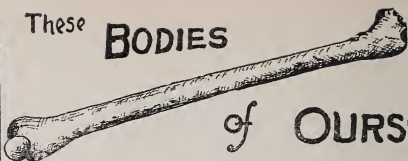
- Battle of Fort McHenry — British defeated.
Treaty of Peace was signed at Ghent.
1815. Battle of New Orleans — British defeated.
1817. James Monroe was inaugurated President.
1819. A treaty for the purchase of Florida was made.
1820. The Missouri Compromise was passed.
1825. John Quincy Adams was inaugurated President.
1826. First railroad built in the United States.
1829. Andrew Jackson was inaugurated President.
1830. Debate in Congress between Webster and Hayne.
1835. Texas declared her independence.
1837. Martin Van Buren was inaugurated President.
1841. Wm. Henry Harrison inaugurated President.
The death of Harrison occurred April 4.
John Tyler was inaugurated President.
1844. 1st Telegraph in practical use in the U. S.
1845. James K. Polk was inaugurated President,
March 4.
1846. Mexicans attacked American dragoons.
1846. Congress declared "War existed by Act of Mexico."
Oregon Boundary Treaty made with Great Britain.
1847. Battle of Buena Vista — Mexicans defeated.
1847. Vera Cruz captured by General Scott.
1847. Battle of Cerro Gordo — Mexicans defeated.
1847. City of Mexico surrendered to Gen. Scott.
1848. The discovery of gold in California.
Treaty with Mexico, peace and territory gained.
1849. Zachary Taylor was inaugurated President.
1850. The death of President Taylor occurred.
1850. Millard Fillmore was inaugurated President.
1853. Franklin Pierce was inaugurated President.
1854. Congress passed the Kansas and Nebraska Bill.
1857. James Buchanan was inaugurated President.
The Dred Scott decision was made known.
1859. John Brown made a raid into Virginia.
1860. South Carolina passed a Secession Ordinance.

1861. Mississippi, Florida, Alabama, Georgia, Arkansas, Tennessee and North Carolina passed Secession Ordinances.
Kansas was admitted into the Union.
Confederate States adopted a Constitution.
Jefferson Davis inaugurated President of Confederacy.
Abraham Lincoln inaugurated President of U.S.
Lincoln proclaimed a blockade of Southern ports.
Battle of Bull Run, Va. — the North defeated.
1862. Fight between the Virginia and the Monitor.
Battle of Shiloh, Tenn. — the South defeated.
New Orleans was captured by a Union Fleet.
Harper's Ferry, Va., captured — the North defeated.
Battle of Antietam, Md., — the South defeated.
Battle of Fredericksburg, Va., — the North defeated.
1863. Lincoln issued the Emancipation Proclamation.
Battle of Chancellorsville, Va., — the North defeated.
Battle of Gettysburg — the South defeated, July 3.
Vicksburg, Miss., surrendered — the South defeated.
Battle of Chickamauga, Tenn. — the North defeated.
Battle of Chattanooga, Tenn. — the South defeated.
1864. General Grant was made Lieutenant-General.
Battle of the Wilderness — result not decisive.
1864. The Kearsarge fought and sunk the Alabama.
Atlanta, Ga., captured — the South defeated.
Savannah captured — the South defeated.
1865. Columbia, S. C., surrendered — the South defeated.
Petersburg and Richmond surrendered to Union troops.
Lee surrendered to Grant at Appomattox Court-House.
President Lincoln was assassinated, April 14.
Andrew Johnson was inaugurated President.
1867. Alaska was bought of Russia.
1868. House of Rep. impeached President Johnson.
Johnson, after trial, was not found guilty.
1869. Ulysses S. Grant was inaugurated President.
1871. The Washington Treaty (Alabama Claims) made.
Fire in Chicago destroys 18,000 houses, Oct. 8, 9, 10.
1876. Centennial Exhibition held in Philadelphia.
1877. Rutherford B. Hayes inaugurated President.
1881. James A. Garfield was inaugurated President.
President Garfield was assassinated, July 2.
Chester A. Arthur was inaugurated President.
1885. Grover Cleveland was inaugurated President.
Death of General Grant.
1889. Benjamin Harrison was inaugurated President.



These

BODIES



of

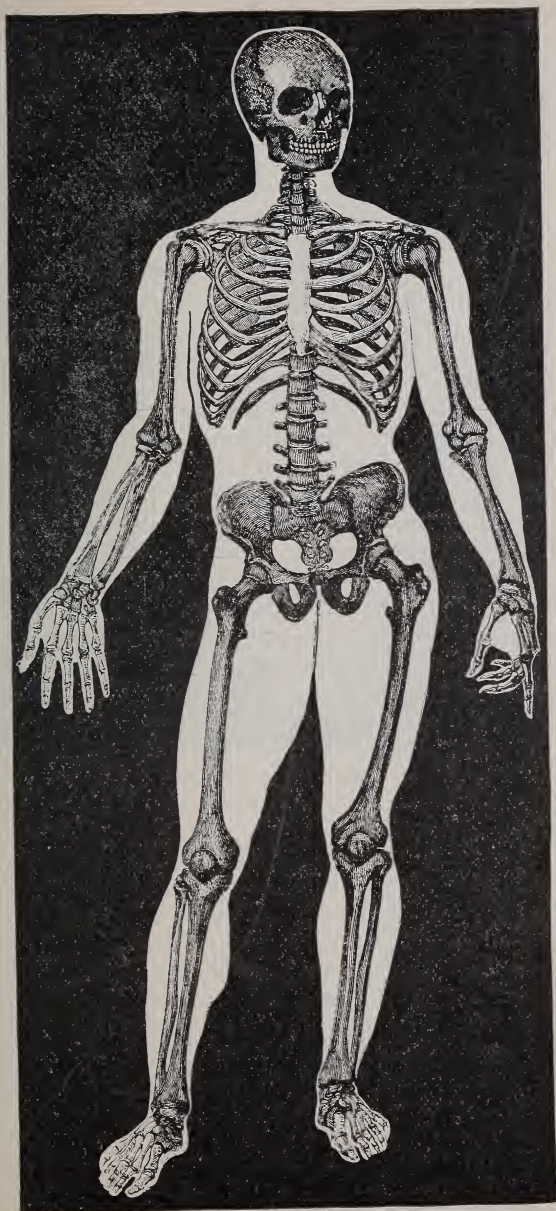
OURS

Our **bodies** are made up of distinct parts, each of which performs a definite work. The framework, which gives its general form to the body, is called the **skeleton**. The skeleton consists of about two hundred and eight **bones**, of which thirty are in the head, fifty-four in the trunk, and one hundred and twenty-four in the limbs. The **muscles** form the red flesh. They completely cover the bones.

The respiratory apparatus is called the **lungs** which fill two-thirds of the **chest**. These lungs are double and of unequal size, the left one being the smaller. The lungs are enveloped by a serous membrane called the **pleura** (inflammation of which is *pleurisy*) which separates them from each other and from the chest walls. In each lung the hundreds of little canals join to form a single tube called **bronchus**. The union of these two tubes forms the windpipe. The lungs are the locality in which a necessary exchange of gases takes place. The blood gives off carbonic acid gas and other impurities and this is given out by the lungs, while the blood needs oxygen which it secures from the pure air which we breathe in.

The **blood** is a liquid somewhat heavier than water. It circulates at a great speed through the entire body. The fresh blood or that charged with oxygen is called **arterial**. It is scarlet in color. The blood which is on its way to become purified is a dark red color and is called **venous**. The arteries start from the heart; the veins run to the heart. The feeding of the tissues of the body is carried on chiefly by the fluid part of the blood. The blood itself is fed from the food taken into the stomach. This blood builds bone and brain, liver and lungs, marrow and muscle. It also collects the waste matters of the body and conveys them to the organs which cast them out.

The **heart** is a hollow organ, situated between the

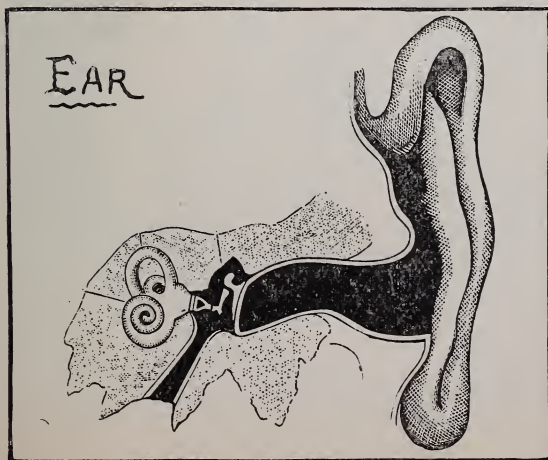
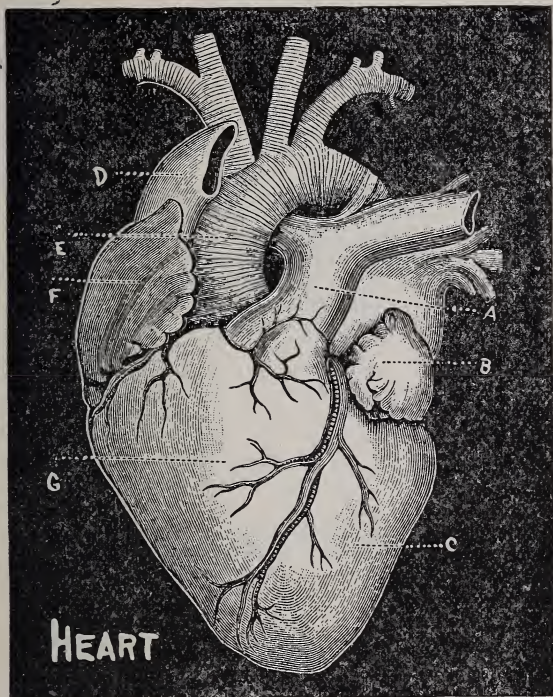


two lungs. It is the pump which propels the blood to all parts of the body. It is conical in shape, its pointed end hanging downwards, and it weighs about ten ounces. The heart is a muscular organ, and it is the property of a muscle to contract. When these muscles contract, they squeeze together the heart-walls and in this way force the blood on its way. The blood is prevented from flowing back over the same course by a system of valves. From the right lower cavity of the heart the **pulmonary** artery goes out and sends branches to both lungs. At every beat, the heart moves about four ounces of blood. The heart of a full-grown man uses as much power in moving blood for twenty-four hours as is necessary to lift one hundred and twenty tons one foot high.

The blood which circulates in the stomach, intestines, and some other organs is collected by the portal vein and carried into the **liver** where a poisonous material which forms in the blood in other parts of the system is destroyed. The liver is the largest organ in the body. One part of its work is to secrete the bile, or gall, used in digestion.

Most of the arteries lie deep in the flesh, but, at the wrist and temple, they are so near the surface that you can feel the **pulse**, or the motion of the blood, as it is sent forward by each beat of the heart. Usually, if the pulse is much faster or slower than the average rate, the person is sick.

The principal organs of **digestion** are the mouth, gullet, stomach, and intestines. Taken together this food canal is about thirty feet long. Here and there, beside it, are little fleshy bags called **glands**. These have the curious power of separating certain juices from the blood. These juices digest the food. A tongue much coated shows that the whole lining of this canal is out of order. The **salivary** glands of the mouth pour upon the food a juice called saliva which not only moistens the food, but transforms some of its starch into sugar. Washing down the food with "drink" will not take the place of slow eating. The **stomach** is a strong muscular bag in the



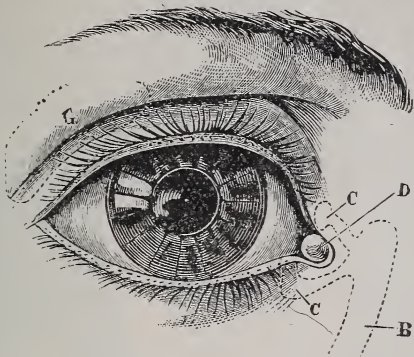
left side of the abdomen. Its inner lining has many glands which separate from the blood a juice, called gastric juice which digests the tissue-making foods. The bile and pancreatic juice digest the fats. If one must eat rapidly, as at a railroad station, the meal should be mainly of meat, as that need not be mixed with the saliva for digestion. The heat of the stomach must be 100° in order to digest the food properly, and anything, such as ice-water, which tends to lower the temperature, if taken too freely, is likely to be injurious.

The process by which the waste products of the body are taken from the blood and cast out of the system is called excretion, which is carried on chiefly by the skin, the lungs, and the **kidneys**. The skin chiefly excretes water in the form of sweat; the lungs are mainly concerned with casting out carbonic acid and water; while the kidneys have for their chief function the excretion of water and urea. These three working together prevent the machinery of the body from becoming clogged and choked with impurities.

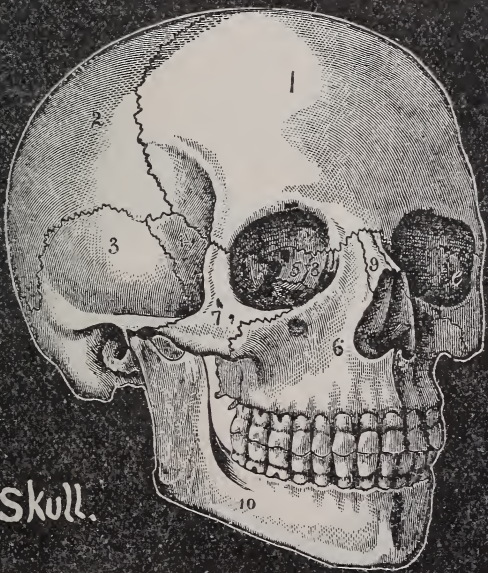
Muscular action, digestion, circulation, and all the work of the body is directed and controlled by the **nervous system**. The centre is the **brain**. The principal cord is the **spinal cord** which passes through the centre of what is commonly called the back-bone. From this cord, slender white threads extend to all parts of the body. The brain is protected from injury by the strong bones of the **skull**.

The **five special senses** are feeling, seeing, hearing, tasting, and smelling. The skin is the great organ of the sense of touch. Nerve-ends take up impressions of contact. The organ of sight is the **eye**. The white of the eye is a hard coat which protects the parts beneath. The colored circle—that which makes us call the eye brown, or blue—is the iris. It is like a circular curtain with a hole in the centre called the pupil. When the light is too bright, the pupil contracts; when too dim, it enlarges. The organ of hearing is the **ear**. The inner end of its canal is closed by a membrane. The auditory nerve proceeds from the base of the brain by bony passages to the internal ear. The sound wave causes the membrane of the tympanum to vibrate. The **tongue** is the organ of taste.

Our **food** is divided into three great classes—mineral food for the bones, tissue-making food, and heat-making food. If a man weigh 160 pounds, about 140 pounds of this weight is nothing but water—quite enough if rightly arranged to drown him. The bones need lime, the brain requires phosphorus, and the blood must have iron.

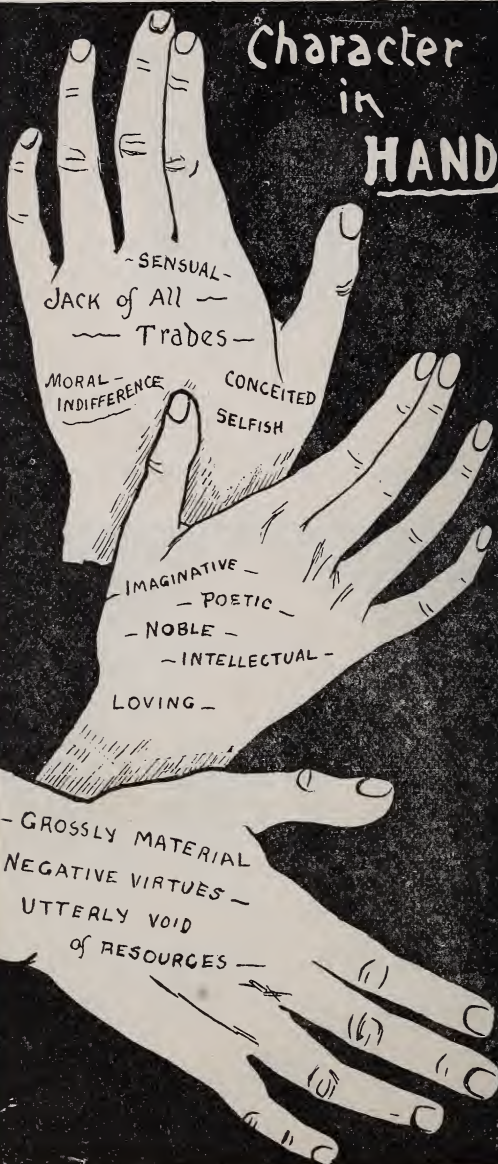


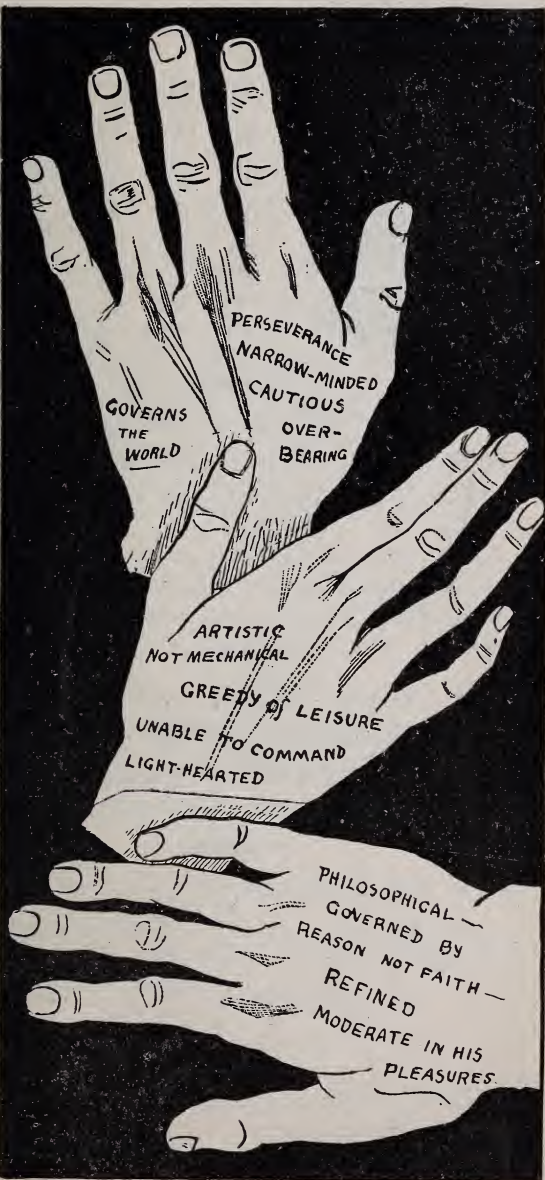
EYE



Skull.

Character in HANDS





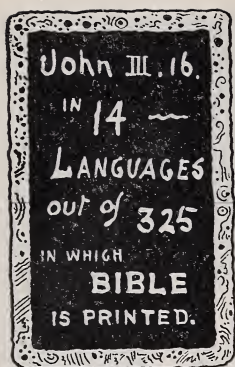
GOVERNS
THE
WORLD

PERSEVERANCE
NARROW-MINDED
CAUTIOUS
OVER-BEARING

ARTISTIC
NOT MECHANICAL

GREEDY OF LEISURE
UNABLE TO COMMAND
LIGHT-HEARTED

PHILOSOPHICAL —
GOVERNED BY
REASON NOT FAITH —
REFINED
MODERATE IN HIS
PLEASURES.



CHINESE.

蓋上帝以獨生之
子賜世俾信之者
免沈淪而得永生
其愛世如此。

BENGALI.

কেননা ঈশ্বর জগতের প্রতি এমত প্রেম করিলেন, যে আপনার
অদ্বিতীয় পুত্রকে দান করিলেন; যেন তাঁহাতে বিশ্বাসকারি
প্রত্যেক জন বিনষ্ট না হইয়া অনন্ত জীবন পায়।

BULGARIAN.

Защото Богъ толкозь възлюбихъ свѣтъ-тъ, щото
даде Сина своего единороднаго, за да не погыне
всякой който вѣрва въ него, но да има животъ
вѣченъ.

ETHIOPIC.

እስመ : ከመዝ : አፋቀሮ : እግዚአብሔር :
ለዓለም : እስከ : ወልደ : ዋሕደ : ወሀበ : ቢዛ :
ከመ : ከሁሉ : ዘየአምኝ : ቦቱ : ኢይተሐጎል :
አላ : ደረክብ : ሕይወተ : ዘለዓለም ::

PERSIAN.

زیرا خدا جهان را این قدر محبت نمود که پسر
یکانه خود را داد تا هر که بر او ایمان آورد
هلاک نکردد بلکه حیات جاودانی یابد

DANISH.

Thi saa har Gud elsket Verden, at han har givet
sin Søn den eenbaarne, at hver den, som roer paa ham,
ikke skal fortabes, men have et evigt Liv.

HEBREW.

בִּי־כָכָה אָהַב הָאֱלֹהִים אֶת־הָעוֹלָם עַד־אֲשֶׁר נָתַן אֶת־
בְּנוֹ אֶת־יְחִידוֹ לְמַעַן לֹא־יֵאבֹד כָּל־הַמְּאֻמִּין בּוֹ כִּי אִם־
יְחִיָּה חַי עוֹלָמִים :

FRENCH.

Car Dieu a tellement aimé le monde, qu'il a donné son Fils unique, afin que quiconque croit en lui ne périsse point, mais qu'il ait la vie éternelle.

GERMAN.

Also hat Gott die Welt geliebet, daß er seinen eingebornen Sohn gab, auf daß Alle, die an ihn glauben, nicht verloren werden, sondern das ewige Leben haben.

PORTUGUESE.

Porque de tal maneira amou Deus ao mundo, que deu a seu Filho único, para que todo aquelle que n'elle crê, não pereça, mas tenha a vida eterna.

RUSSIAN.

Ибо такъ возлюбилъ Богъ міръ, что отдалъ Сына своего едиnorodнаго, дабы всякій, вѣрующій въ Него, не погибъ, но имѣлъ жизнь вѣчную.

SANSKRIT.

ईश्वर इत्थं जगददयत यत् स्वमद्वितीयं
तनयं प्राददात् यतो यः कश्चित् तस्मिन्
विश्वसिष्यति सोऽविनाश्यः सन् अनन्तायुः
प्राप्स्यति ।

SWEDISH.

En så älskade Gud werlden, att han utgaf sin enda Son, på det att hwar och en, som tror på honom, skall icke förgås, utan så ewinnerligit lif.

SPANISH.

Porque de tal manera amó Dios al mundo, que ha dado á su Hijo Unigénito, para que todo aquel que en el cree, no se pierda, mas tenga vida eterna.

Famous -
Rulers

Louis XI

LOUIS XI

Elizabeth

Victoria
Francis

Henry

HENRY IV

Louis Napoleon Bonaparte



The Hair. People with hairy hands and bodies have a good deal of the *animal* in their make-up. Straight, lanky, black-haired individuals are melancholy and depressing. Many of the most famous men of all time were smooth-faced. Hair which has a natural tendency to curl denotes an affectionate and merry disposition. Red-haired people are usually quick-tempered. Very fair-haired blondes are apt to be dreamy, listless, and imaginative. They are restless rather than energetic. Brown-haired people are nearly always of a more or less sentimental and romantic temperament, fond of travel, and liberal minded. When the hair is soft of texture you will find a generous heart full of sympathy.

The Eye-brows. Space between the eye-brows indicates an open, unsuspicious, frank nature. Gently curved eye-brows indicate artistic taste, and sentiment. The high-placed, curved eye-brow tells of indecision of character. Men of intellectual force frequently possess thick, bushy eye-brows. Such men are often irritable and untidy. Eye-brows lighter than the hair is a sign of weakness. Short eye-brows mean short temper.

The Eyes. Light eyes denote cunning. Eyes in which the green tint is distinctly visible indicate talent. Gray eyes show poetic temperament, and quite often intellectual power. Most of the poets have had gray eyes. Brown eyes denote affection, and courage, and ability. They lack consistency in love affairs. If eyes are large, full, and rounded, they show timidity, and, perhaps, an unusual interest in the opposite sex.

The Nose. The arched, beak-looking nose in large men indicates commanding power. The straight, drooping nose is melancholy. The turn-up indicates inquisitiveness. Such noses go ahead with their plans despite all interferences. The snub-nose is coarse. The broad nose indicates brain power. The thin nose indicates weakness.

The Mouth. With turned down corners it indicates sourness of disposition, while the turned up corners indicate merriment and light-heartedness. Thick lips indicate warmth of heart; thin lips denote coldness and cruelty. A single, harsh line represents the mouth of the shrewd, severe, stingy man. The

firm mouth, with the determined closing of the lips, shows that the person has a decided will and will stop or go forward at pleasure. Lips which fall away from the teeth indicate a want of self-control. The shape of the mouth may not be pretty but the words which come from it can always be pure, and cheerful, and good.

The Chin. The chin is the rudder. Flat chins indicate coldness of temperament—egotism. A pointed chin denotes a selfish disposition. A rounded, protruding chin, tells of force and some materialism. The chin which falls back from the mouth to any great extent indicates an individual of weak character, who will need to be carried in a basket and fed with a spoon. A man with a double chin is jovial, fond of his meals—a sensualist. The larger the jaws the greater the animal instincts. A square chin with a dent underneath on the line of the bone, indicates decision and obstinacy, with fondness and warmth of temperament.

The Ears. Timid animals have long ears. The small ear is indicative of affection. Upright ears indicate courage and strength. Ears which stand out from the head in a wolfish kind of way, denote cruelty, and, when closely formed, avarice. When the ear is high above the eye it belongs to an individual who has a revengeful, quick temper. Ears well back, that is, with most of the head in front of them, denote a strong brain, while ears which leave much of the head back of them, denote an animal, narrow, selfish disposition.

The Neck. Notice necks among birds and animals. The silliness of the ostrich and the goose is proverbial. The bull, the buffalo, and the lion are short necked. Long necked people are timid and obedient. The manly and courageous, the firm, the obstinate, and the cruel are thick necked.

The Forehead. The reading man whose mind is a storehouse of acquired knowledge, has a narrow, high forehead. He is well informed, but has gathered his information from reading rather than from observation. The low, wide forehead belongs to the imaginative, brilliant, naturally talented man. The wide, high forehead belongs to the genius who will sooner or later reach the top rung of the ladder. If the forehead be unwrinkled we may assume a want of sensitiveness and of imagination. There is very little sympathy in the unwrinkled brow.

LESSONS FOR THE PEOPLE

Law. The laws enacted by the legislature are called *statute law*, while those principles and usages which rest for their authority upon their long-continued acceptance and their adoption in judicial decisions, are called *common law*.

Contracts. An agreement, duly entered into, by competent parties, for a legally sufficient consideration, to do or not to do some specific thing, is a *contract*. It is not necessary that such agreement be in writing. If one party to a contract breaks it without the consent of the other, the other may enter suit for damages.

False representation. To secure a money through false representation is a serious offence. A mere statement of opinion, and generally of value, though false, is not considered fraud in law. The law considers the purchaser as capable of judging the value of an article as the seller.

Drunkard. A contract made by a person so intoxicated as not to know what he was about, is not binding upon him, unless he agreed to it after he became sober. It is binding, however, on the other party unless the intoxicated person retracts.

Executor. The executor of an estate is the person appointed by a testator to execute his will or to see it carried into effect. If an executor or administrator, in settling an estate, makes new contracts, or incurs new debts, he is personally responsible for them.

Guardian. A guardian is a person who is legally appointed to have charge of the person or property of another, generally for minors.

Minors. All persons under twenty-one years of age are minors. In Vermont, Maryland, Ohio, Illinois, and some other States, a girl is of age at eighteen. As a general rule, a minor may avoid contracts made by him, except such contracts are made for the necessities of life.

Consideration. The consideration is the inducement offered by one party, by reason of which another party enters into an agreement. A simple promise, made without consideration, is not sufficient to make a legally binding contract.

Collections. A promise to pay part of a disputed claim is binding, even though there was in reality no original indebtedness. A payment of part of a claim is an acknowledgment of the whole claim.

Trade. A man may contract not to carry on a certain legitimate trade in a certain town for a definite number of years, but a contract never again to carry on such trade anywhere would not be binding.

Agent. An agent is one who has legal authority to act in behalf of another. No one can lawfully act as another's agent without his consent. Authority to collect a debt is authority to take cash only; authority to sell is not authority to give credit. A principal is liable for any fraud, deceit, negligence, or wilful misconduct of his agent, committed while acting fairly within the limits of his agency.

Partnership. A partnership is the relation existing between two or more persons who have joined together their money, goods, skill, and labor, or any or all of these, in some business, in which they divide the profits or share the losses. In general partnerships each partner is personally responsible for the entire debts of the partnership. A partnership may be created for any period of years or simply for a single transaction. No partner has a right, without the other's consent, to engage in any outside business which competes with, or is against, the interests of the partnership. In the management of a partnership affairs the partners have equal rights, even though their interests are unequal. A partner may take money or goods of the firm and charge them to his own account. Each partner has power to bind the firm in any purchase or contract within the limit of their business, without the consent or knowledge of the other partners. One partner cannot convey real estate without the consent of the other partners. The firm name must be signed to negotiable paper to render the firm liable. A partnership may be dissolved at any time by the consent of all the partners. If good reason is shown and a mutual dissolution cannot be reached, a court of equity may dissolve the partnership by appointing a receiver to wind up the affairs.

Sales. In a sale there must be a change of possession, but actual delivery is not necessary to pass the title. To prevent sales whose object is to defraud creditors, if the seller still retains the article sold, a creditor can attach it as the property of the seller, unless the seller can show that the sale was genuine. Where the intention of the parties, either expressly

stated, or clearly implied in the circumstances, is to fix some condition to the sale of goods, this condition must be satisfied before the absolute title will pass to the buyer. A sale is often made under an agreement that the title will not pass until the goods are paid for. This is commonly the case in buying on the instalment plan.

Chattel Mortgage. A chattel mortgage is a sale of personal property as security for some debt or other obligation, the sale to be avoided by the repayment of the money, with interest, within a certain time. The mortgagor (or seller) usually retains the property mortgaged in his possession. Chattel mortgages must be filed in the office of the town or county clerk according to the laws of the place where they are given. The mortgagor usually has sixty days grace after the expiration of the mortgage in which to pay the amount due. A clause is usually inserted giving the mortgagee power of immediate possession.

Warranty. A warranty is an undertaking by the seller, either expressed or implied, that a certain fact in regard to the thing to be sold, is, or shall be, as it is promised in the contract. If the warranty is not fulfilled the buyer may return the goods, or he may receive damages.

Lien. *Lien* is the right of the seller to hold goods sold until he is paid for them. As soon as they pass out of the seller's hands, this right ceases. Workmen may "place a lien" on the building upon which they have been working, for wages due.

Bailment. The placing by one person of some article of personal property in the possession of another, to be held till the special purpose of this delivery is accomplished and then to be returned. The essential element is a change of possession without a change of ownership. Common examples of bailments are loaning articles, storing goods, hiring horses, carrying goods from place to place, etc.

Negotiable Paper. This name is given to a certain class of written contracts, such as promissory notes. The word *negotiable* means *transferable*.

Bill of Exchange. Bills of exchange are designed to secure the payment of a distant debt without the transmission of money, by exchanging the debt owed by the drawer to the payee for a debt owed by the drawee to the drawer. *Draft* is merely a business man's name for a bill of exchange.

Accommodation Paper. This name is given to a note which is signed by one person simply for the

accommodation of another. If the party giving the accommodation is obliged to pay the note, he can always recover from the accommodated party the amount so paid.

Days of Grace. On all notes, except when made payable on demand, three days of grace are allowed. Even when payable "at sight" or "after sight" days of grace are allowed. Notes falling due on Sunday or on a holiday are payable the day before.

Endorsers. By writing his name on the back of a note the endorser contracts that the note is genuine and binding on all the parties before him; and that, if presentment and demand for its payment are made on the acceptor or maker at its maturity, and he is duly notified in case payment is refused, he will pay it.

Protest. On the day of maturity of a bill or note, the acceptor or maker becomes liable to the holder for its payment whether or not demand for payment is made upon him. But indorsers become liable only on the condition that the paper shall be presented and payment demanded on the day of maturity; and that, if payment is refused, notice of the dishonor shall be sent to them promptly. Such notice made by a notary public is commonly called a *protest*, or the note is said to have "gone to protest." If an endorser pays a note, he can recover of any one of the parties preceding him on the paper.

Limitations. As a general rule a suit at law must be brought on a bill or note within six years after its dishonor, or the parties liable on it are discharged.

Deeds. This name is given to any written instrument to which a seal is affixed. Commonly, however, it means an instrument for the conveyance of real estate. If the grantor is married, his wife should join him in signing a deed. Deeds which contain covenants warranting the title conveyed, are called *warranty deeds*. A deed, to be a good conveyance of real estate, should be (1) signed, (2) sealed, (3) witnessed, (4) acknowledged before a justice of the peace, (5) delivered, (6) recorded.

Mortgages. A mortgage is a conveyance of real estate as security for a debt or other obligation. To *foreclose* a mortgage is to cut off the mortgagor's equity of redemption. A clause is usually inserted giving the mortgagee power, after a certain number of days, to sell the property at public auction. The surplus, if any, belongs to the mortgagor. When a mortgage is *discharged* such discharge should be properly recorded.

Lease. A lease is a contract, by which the temporary use and possession of lands and buildings is granted by one person to another.

Poor Debtor. Under the poor debtor laws a man who cannot pay a debt may be released by taking what is called the "poor debtor's oath."

Attachment. This is a writ issued at the commencement of, or during, a suit at law, commanding the sheriff, or other proper officer, to attach the property of the defendant to satisfy the demands of the plaintiff. In many States the defendant may dissolve an attachment by giving a bond, with sureties, that he will pay such judgment as the plaintiff may obtain in the suit.

Judgment. A suit is ended by the court's giving a final judgment, either for the plaintiff or for the defendant.

Execution. This is the act of carrying into effect the final judgment of the court.

Garnishment. This is also termed "trustee process." It is a process of attaching money or goods, due a defendant, in the hands of a third person.

Suggestive Questions.

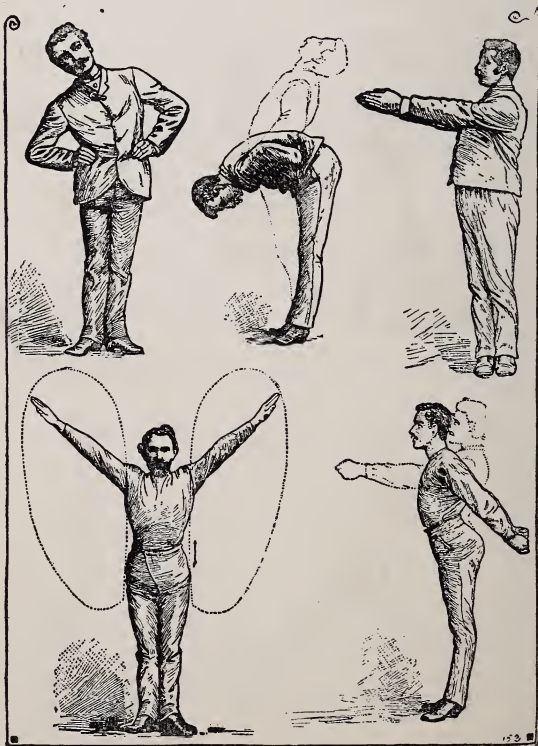
1. When is a note or draft non-negotiable?
2. How does a sight draft differ from a check?
3. If a note falls due on Sunday, when is it legally due?
4. Why are the words *value received* inserted in notes?
5. Can paper be transferred after maturity?
6. When is a note due if dated January 31 and made at one month?
7. What is the meaning of a debt's becoming "out-lawed"?
8. Is there any warranty in a sale by sample?

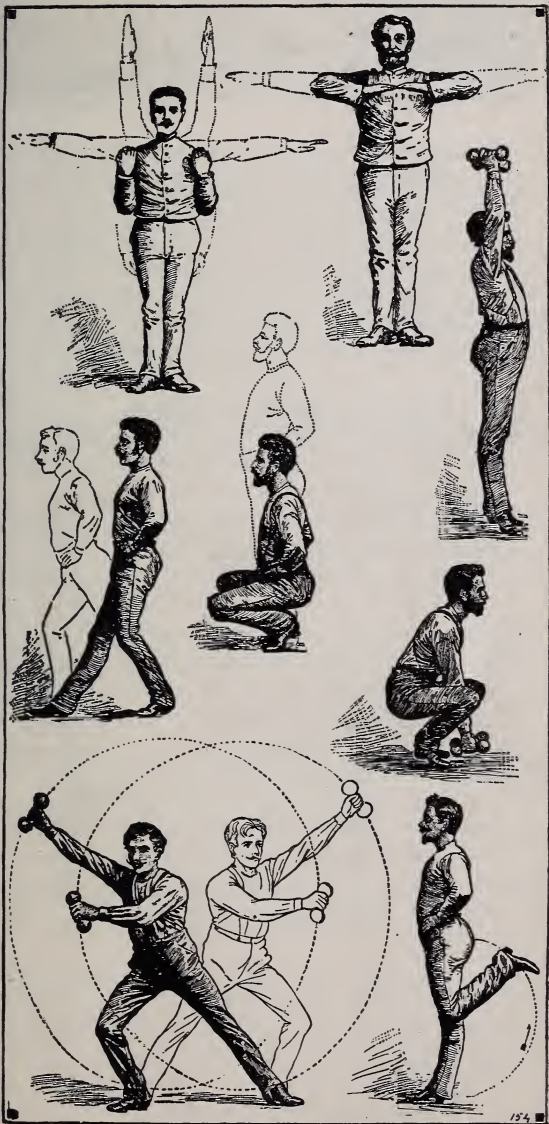
Hint. — A little law is often a most dangerous thing; for it may give an exaggerated sense of assurance which might lead one to base his action on a wrong application of some self-understood principle. There is nothing more expensive than lawsuits. An ounce of prevention is here often equivalent to many pounds of cure. If you are in doubt about your rights or duties seek the advice of some lawyer who is known as a man of integrity rather than as smart and unscrupulous.



PHYSICAL CULTURE

NOTE. — Gymnastics should serve the purpose of preserving health and increasing strength, rather than of curing disease. The effect of the free movements may be materially heightened if performed with dumb-bells. To be of decided benefit exercises should be performed with **absolute regularity**. Persons who have not been in the habit of taking exercise of any kind, beyond perhaps an occasional walk, should begin with moderation. The best time for exercises is immediately before meals. The dress of the gymnast should be comfortable, leaving all movements of the body unimpeded. Man can attain complete development, mental vigor, and health, only when his various powers are exercised equally and brought into harmonious action.





Proof Reading

a/ THOUGH several differing opinions exist as to the individual by whom the art of printing was first discovered; yet all authorities concur in admitting Peter Schoeffer to be the person who invented *cast metal types*, having learned the art of *cutting* the letters from the Gutenberg; he is also supposed to have been the first who engraved on copper plates. The following testimony is preserved in the family, by Jo. Fred. Faustus, of Ascheffenburg: [] Peter Schoeffer, of Gernsheim, perceiving his master Faustus design, and being himself desirous ardently to improve the art, found out (by the good providence of God) the method of cutting (*incidendi*) the characters in a *matrix*, that the letters might easily be singly cast instead of being cut. He privately cut matrices for the whole alphabet: Faust was so pleased with the contrivance, that he promised Peter to give him his only daughter Christina in marriage, a promise which he soon after performed.

as/ But there were many difficulties at first with these letters, as there had been before with wooden ones, the metal being too soft to support the force of the impression: but this defect was soon remedied, by mixing a substance with the metal which sufficiently hardened it.

and when he showed his master the letters cast from these matrices.

9
Caps

1-1
2/

J.C.

Antique

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Hal

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Rom.

Hal

C

tr

transpose



There are thousands of boys who yearly apprentice themselves to the old **well-known trades** such as that of carpenter, or bricklayer, or plasterer, or stonemason, or blacksmith, for the simple reason that they are not familiar with other trades much less crowded and affording steady employment at good wages. In the brief space allowed for this article we can do little more than give the names of a number of the best trades and professions, allowing the **ambitious boy** who reads these pages to seek out additional information for himself.

Architects: Aptness for drawing necessary. Best architects in large cities have incomes equal to the best lawyers.

Book-binders: The work of folding, collating, sewing, covering, laying on gold, etc., is usually done by girls. They earn about six dollars a week. The heavier work is done by men whose wages rarely exceed three dollars a day.

Brassfounders: A branch of work which gives employment to an immense number of men. It is clean and comparatively light, but is usually considered injurious to health.

Designers: See department of mechanical drawing and designing. Large wages are paid designers who prepare original designs for wall-paper, carpets, curtains, and all kinds of decorative material.

Electrotypers: The chief work of electrotype foundries is that of preparing book plates from type, and of duplicating engravings. The work is done by men, and the wages average about \$15 a week.

Civil Engineers: Must have a liking for mathematical studies. The best modern schools, such as the Massachusetts Institute of Technology, now give a thorough practical education. The engineers who plan our great buildings, bridges, railways, tunnels, steamboats, etc., receive immense sums of money for their work.

Engravers: The *process* engraving of modern times has greatly reduced the demand for all kinds of hand engraving for illustrating purposes.

Glass-makers: There are few occupations which show such numerous varieties as those in which glass is manipulated. Ordinary workmen receive about \$18 a week, while good glass cutters receive from \$20 to \$40 a week. Most operatives work by the piece.

Printing: There are several departments. Good pressmen who are capable of running the large steam-presses are usually paid about \$20 a week. Compositors are paid about fifty cents per thousand ems for type-setting and earn about \$15 a week. In large cities a good deal of the type-setting in job offices is done by girls. See the chapter on reporting.

Type-writing: The supply at present is fully equal to the demand. Most of the work is done by girls. They earn from six to twelve dollars a week.

Carving: Wood and stone carving afford excellent openings for boys who have drawing and designing ability.

Miscellaneous Trades and Employments: Accountants, advertising agents, collection agents, purchasing agents, analytical chemists, appraisers, assayers, cabinet makers, boiler makers, box makers, plumbers, gas fitters, brokers, carriage makers, painters, china decorators, surveyors, saddlers, commission merchants, contractors, coppersmiths, costumers, bakers, curriers, decorators, dentists, doctors, chiropodists, detectives, diamond cutters, die sinkers, dress and coat designers, druggists, importers, electricians, embossers, enamelers, exporters, florists, iron-founders, fresco-painters, furriers, galvanizers, gilders, glass stainers, glaziers, importers, inspectors, Japanners, kalsominers, lawyers, doctors, teachers, lithographers, stationers, locksmiths, machinists, manicures, metal roofers, metallurgists, millwrights, mineralogists, musicians, newspaper correspondents, hospital nurses, opticians, sign painters, paper dealers, paper hangers, perfumers, photo-engravers, photographers, piano tuners, platers, polishers, publishers, reporters, sculptors, ship chandlers, silver-smiths, smelters, soap makers, steam fitters, railway conductors, brakemen, steel engravers, taxidermists, telegraphers, turners, undertakers, upholsterers, advertising writers, veterinary surgeons, wagon makers, carpet weavers, wire workers, wool brokers.



INTRODUCTORY NOTE.

The field of **electrical science** offers, at the present time, more and better openings for young men, and more rapid advancement for the able and the ambitious, than almost any other wage-earning pursuit. Young men who are anxious to enter this field should prepare themselves for its practical affairs by a thorough study of the subject. For those of limited means who wish to study at home we know of no better course than that arranged by Boston Home College. The few pages of hints given here will prove valuable to all who are anxious to become familiar with general principles and much used terms.

HINTS AND HELPS.

Ammeter, or Ampère-Meter, an instrument for measuring the current passing through a conductor.

Conductors. Metals readily allow electricity to escape through them. Non-conductors such as glass, rosin, silk, wool, india-rubber, offer great resistance to its passage.

Insulated. A body is said to be insulated when it is not in contact with any other bodies except non-conductors.

Positive electricity repels positive electricity and attracts *negative* electricity. In like manner negative electricity repels negative and attracts positive.

Measured. Electricity is measured by the repulsion or attraction which it is capable of exerting. The unit quantity is that which, if collected at a point, would exert unit force upon an equal quantity at unit distance. The force varies inversely as the square of the distance, so that at a mutual distance of 2 units the force exerted by one unit quantity upon another would be $\frac{1}{4}$ of the unit force.

Density. The electric density on any small element of the surface of a charged conductor signifies the quantity of electricity per unit area at this point.

The Leyden jar is a contrivance for accumulating large quantities of electricity.

Heat. Electric currents produce heat in the wires through which they flow. Short and thin wires of iron are easily melted.

Ohm. The unit by which the resistance offered to the passage of an electric current is measured.

Meter. An instrument for measuring the amount of electrical energy used.

Motor. A general name applied to electrical machines used for imparting mechanical power.

Parallel wiring. A system of electrical distribution, in which each lamp has its individual flow and return wires, no current passing through two lamps in a series.

Permanent magnet. A piece of steel or load-stone containing enduring magnetic force, and requiring no electric current to magnetize it.

Photometer. An instrument for measuring the intensity of light.

Electro-metallurgy. The science or process of electrically decomposing solutions or salts of metals.

Magnetic field. The term used to express the space between the poles of a magnet through which the magnetic lines of force exist.

Filament. The thread-like substance of an incandescent lamp, composed usually of vegetable matter which by the application of intense heat has been carbonized.

Galvanic electricity is that produced by chemical action.

Galvanometer. An instrument used in testing for showing the flow of an electric current.

Horse-power. The unit by which the rate of doing work is measured. It is equal to the power expended in raising 33,000 pounds one foot high in a minute.

Earth-return. A circuit in which the ground forms part of the conducting path.

Electrodes. The two terminals forming the positive and negative poles in a battery.

Electro-magnet. A bar of soft iron temporarily magnetized by the influence of an electric current passing through an encircling wire.

Counter-shafting. Intermediate shafting used to distribute power or to increase or decrease speed of machinery.

Distribution-board. A board from which branch wires or cables are led to various positions.

Dynamo. A machine for producing electricity by transforming mechanical work into electrical energy.

The *dynamo* is the mechanical power which "manufactures" electricity; the *motor* is the machine which changes the electricity into mechanical power.

Electrical energy. The capacity of electricity for doing work, whether for electric lighting, or for power or traction purposes. It is directly proportionate to the amount of current and its pressure. Thus by multiplying the flow of currents in ampères by the pressure in volts the amount of electrical energy is obtained.

Cell. A box or other receptacle containing the elements and solutions necessary for the production or storage of electrical energy. A number of such cells are termed respectively a battery or an accumulator.

Ampère. The unit by which the flow of current is measured.

Arc lamp. Produced by the electric current flowing between two carbon points which are slightly separated.

Armature. That portion of a dynamo which revolves between the magnets, and in which the electric currents are induced.

Batteries. A means of generating electric currents by chemical action.

Brush. An arrangement of copper wires or gauze for collecting the current from the commutator of a dynamo.

Candle-power. The standard wax candle used for measuring the luminosity of any light burns 120 grains per hour.

Carbons for arc lamps are rods or pencils generally made from powdered gas coke.

Incandescent lamp. A glass ball from which the air has been exhausted, containing a carbonized filament which becomes incandescent on the passage of an electric current through it.

Mains. Copper cables or other means used for the purpose of conveying electricity, chiefly applied to the larger conductors.

Potential. Pressure; the difference of potential is the electrical pressure between any two points, and is measured in volts.

Primary Cables. In an electrical system of distribution where high-pressure current is transformed to low pressure all cables and devices conveying the high-pressure current are termed primary.

Resistance-coil. A coil of wire offering a certain known resistance to the passage of a current.

Safety-fuse. A device for automatically stopping the flow of electricity in case of accident or defects in the conductors.

Switch. An arrangement for breaking or completing an electric circuit.

Volt. The unit by which the electro-motive force or pressure of current is measured.

The Watt. The unit by which electrical work (or, in other words, the electrical energy consumed) is measured. It is equal to the current of one ampère flowing at a pressure of one volt.

Watt-hour. A term used to indicate the consumption of the electrical energy of one watt in one hour. By multiplying the current in ampères by the pressure in volts, and again by the hours in use, the amount of electrical energy consumed is obtained in watt hours.

Three much used terms. Remember that the *volt* is the practical unit of measurement of pressure; the *ampère* is the practical unit of measurement of the rate of flow; and the *ohm* is the practical unit of measurement of resistance.

Transmitter. That part of the telephone into which we speak is called the transmitter. This is usually a piece of wood having a round mouthpiece cut through it. At the other side of this mouthpiece is placed a diaphragm made of a thin piece of metal, which is held in place by a light spring. Behind this diaphragm and very close to it is placed a carbon button. Between this carbon button and the diaphragm is a small piece of platinum, which is placed so as to touch both the button and diaphragm very lightly.

Receiver. That part of the telephone which is held to the ear, and by which we can hear the words spoken into the transmitter at the other end of the line.

Multiple Arc. The name applied to the method of wiring adopted for incandescent lamps.

Open circuit batteries are those which are used where the electricity is not required constantly without intermission, for instance, in telephones, electric bells, annunciators, etc.

Trolley. The pole connecting the electric car with the overhead wire and through which the electricity passes to the motor below.



The Chairman. He must remember that the great purpose of all rules and forms is to subserve the will of the assembly rather than to restrain it; to facilitate, and not to obstruct, the expression of their deliberate sense. The Chairman rises to put a question to vote, but may state it sitting. He should always say, "The Chair decides so and so." He cannot interrupt a speaker who is not transgressing any rules of the assembly. He may vote when the vote is by ballot. The Chairman should never put a motion relating to himself. This is done by the person making the motion. When a member rises to speak, he says, "Mr. Chairman." The Chairman responds, saying, "Mr. ——." When a motion is before the meeting the Chairman says, "The motion is so and so, are you ready for the question?" If no one rises to speak, he says, "As many as are in favor, etc., will say aye;" after the ayes have voted, he says, "As many as are of contrary opinion will say no." When the Chair is asked to nominate a committee, he reads the names he has chosen and says, "As many as are in favor of these gentlemen constituting the committee will say aye." The following are a few of the ordinary forms covering other duties: "Is there any other business?" — "What is the pleasure of the meeting?" — "What will you do with the report?" — "The report is accepted" — "The minutes stand approved" — "The next business in order is so and so" — "This meeting stands adjourned."

Voting. If, when the Chair announces a vote, any member doubts the vote, the Chairman says, "A division seems necessary; those in favor of the motion shall rise, etc." Tellers may be appointed to count the vote. Until the negative is put, it is in order for any member, in the same manner as if the voting had not been commenced, to rise and speak, and thus renew the debate. In such cases the question is in the same condition as if it had never been put. The assembly and not the Chair orders a vote by ballot. Tellers are appointed by the Chair. Where there is only one candidate for an office, and the constitution requires the vote to be by ballot, it is common to

authorize the clerk to cast the vote of the assembly for such and such a person; if any one objects, it is necessary to ballot in the usual way.

Motions. A *principal* motion is made to bring before the assembly any particular subject. No principal motion can be made when any other question is before the assembly. *Secondary* motions are such as are applied to other motions, for the purpose of most appropriately disposing of them. Secondary motions take precedence of principal motions and must be decided before the principal question can be acted upon. A motion to adjourn, when unqualified, takes precedence of all others. It is not debatable, cannot be amended, nor can a vote on it be reconsidered. A motion to refer a question to a committee can be made while principal and secondary motions are pending. A motion may be made to defer action to a certain time. A question may be set aside temporarily by moving that it "lie on the table." Such a motion allows of neither debate nor amendment. If carried the question "lies on the table" until the assembly votes to take it up again. Debate may be cut off by ordering the "previous question." The Chair immediately says, "Shall the main question be now put?" A two-thirds vote is necessary. When a question is introduced that the assembly do not wish to consider, the proper course, is for some one to "object to the consideration of the question." No seconder is needed. The Chair says, "Will the assembly consider this question?" A two-thirds negative vote will dismiss it. After a question has been adopted, any one who voted for it may move to "reconsider the vote." Such a motion, if carried, opens up the entire original debate. If a speaker uses improper language some one may say, "I call the gentleman to order," when the Chair decides whether the language is disorderly.

Debate. All remarks must be addressed to the Chairman and confined to the question. When it is evident that many are in favor of a motion the Chair need not wait for a seconder. The Chair says, "The question is so and so, what is your pleasure regarding it?" When an amendment is before the assembly the main question cannot be debated. When referring to another member, a speaker should say, "the gentleman who spoke last, etc.," rather than use his name. Remember that it is not the man but the measure which is the subject of debate. If the Chairman rises to state a point of order, or give information within his privilege, the speaker takes his seat. Debate is not closed until both the affirmative and negative are put.



INTRODUCTORY.

This department describes a new system of **short-hand**, not a new system of **phonography**. It does not claim to be scientific, or to stand comparison with other systems requiring months of study and practice. For the great multitude who can use a knowledge of shorthand to advantage only occasionally, this system will be found quite helpful. As will be seen, but little is used beside the ordinary letters of the alphabet, the nine digits, and the simple mathematical and other signs with which all are familiar. Those who have never given the matter thought will be surprised to notice how few letters or characters are necessary for the intelligent writing of any word. The omission of superfluous letters alone reduces the text about one-third.

1. WORD CHARACTERS.

√ a, an	□ these, those
. the	~ at
— cf	L on
—— for	÷ by
= from	× to
|| with	□ this, that
⌋ under	< so
⌋ over	≡ as — as, so — as
& and	: not
∨ but	.. if
> as	+ in

2. PREFIX AND AFFIX SIGNS.

1 ch, sh	6 { ain, ine, en, ian ion, eon, ign
2 pre, pro, per, pur	7 ary, ery, ory
3 able, ible	8 ing
4 ance, ence, ense	9 sion, tion
5 cial, tial	0 ant, ent

3. COMBINATIONS.

||. with the	&□ and this
=√ from a	L√ on a
— of the	×. to the
— for the	∩× over to
—√ for a	: ||. not with the
=□ from this	÷□ by this
—□ for these	: ∪. not under the
∪□ under this	=∪ from under

4. RULES.

1. The vowels have always their usual alphabet sound:

a	as in fate
e	as in me
i	as in pine
o	as in note
u	as in tube

2. The short vowels, as **a** in **far**, **e** in **met**, **i** in **pin**, **o** in **not**, and **u** in **tub**, are usually omitted entirely.

3. Three double vowels are written as follows:

)	ou as in pound
(	oi as in boil
o	ew as in chew

4. Omit all unnecessary letters whether vowels or consonants.

5. ILLUSTRATIONS.

||. xkr9	with the excursion
=. lrl	from the church
2ls□ t3	purchase this table
1 2fr □	I prefer that
2od ||. tk8	proceed with the talking
=□ od3 s)ND	from this audible sound
√ 1rt wlκ	a short walk
st + . tp g17	sit in the top gallery
18L □ h)s	shingle this house
s8 it ∩ × me	sing it over to me
□ s √ lg0 lez	this is an elegant cheese

6. ILLUSTRATIONS.

2y	prey	n3	nible
2p	prop	d4	dance
2ty	pretty	L4	lance
lv	prove	f4	fence
2s	purse	t4	tense
t3	table	h4	hence
f3	fable	p4	pence
c3	cable	pr4	prance
g3	gable	Fr4	France
st3	stable	m6	mine
b3	bible	r5	rain
m7	Mary	2l4	perchance
v7	very	2b3	probable
th8	thing	l4	chance
r8	ring	20	chant
br8	bring	2v0	prevent
s8	sing	Lm0	lament
k8	king	st7	story
st8	string	Lf3	laughable
w8	wing	af3	affable
s0	cant	so5	social
l0	lent	ac9	action
lrg	charge	—gt	forget
lep	cheap	2cd	procede
lnt	chant	~tk	attack
l(c	choice	2su	pursue
lsL	chisel	l8L	shingle

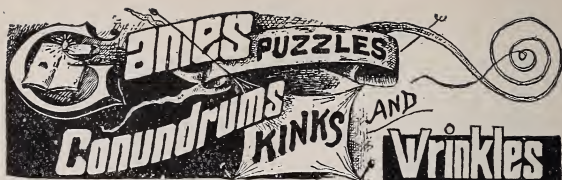
7. RULES.

5. As far as possible let each small word of frequent occurrence be represented by a single letter, as :

m	am or me	g	go	u	you
r	are	w	we	h	he, him
		t	it		

6. Small words which cannot be conveniently represented by a single letter, should be written with two letters, as :

hv	have	sn	seen	ws	was
yr	your	hr	her		



Good Puzzles.

A Paradox. I went to South America and stopped there, but was sent home because I didn't go there. What am I? (A watch.)

Two Riddles. 1. What is that which every one can divide, but no one can see where it has been divided? 2. What is perfect with a head, perfect without a head, perfect with a tail, perfect without a tail, perfect with either, neither, or both?

For Farmers. A man and a boy are engaged to clear up a potato field. The man can dig as fast as the boy can cut the tops, but can cut the tops twice as fast as the boy can dig. In what proportion should they be paid?

A Magical Arrangement. Arrange these twelve counters so that, instead of counting four counters in a row, they will count five in a row. The counters are to be kept in the form of a square with an equal number on each side. (This is done by making the corners two deep, that is, by taking one off each side and putting it on top of a corner counter.)



A Good Sell. I can stretch my arms apart, having a coin in each hand, and yet, without bringing my hands together, I can cause both coins to come into the same hand. (I put down one coin and pick it up with the other hand.)



An Old Problem. A ferryman has a fox, a goose, and a peck of oats to carry over a river, but on account of the smallness of the boat, he can carry over only one at a time. How can this be done so as not to leave the fox with the goose, or the goose with the oats?

Worth Trying. In a stable where there are some horses and grooms, can be counted 82 feet and 22 heads. How many horses and how many grooms were in the building?

Corners and Cats. A room with eight corners had a cat in each corner, seven cats before each cat, and a cat on every cat's tail. What was the total number of cats? (Ans. 8.)

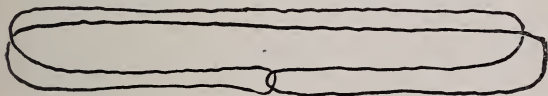
Mechanic's Puzzle. Cut a piece of cardboard, ten inches long by two inches wide, in such a manner as to form a perfect square, without waste.

A Droll Drawing-Room Trick.

You take six pieces of paper; place three of them on the back of your hand, and, as a preliminary operation, blow them away with an air of great mystery, informing your audience at the same time that you are about to explain to them some new kind of magnetism. Then, placing the other three pieces on your hand, you say — “Which of the three pieces do the company desire shall remain on my hand when I blow on them?” When one has been selected, you place the forefinger of your other hand upon it and blow the other pieces away. The absurdity of this mode of solving the problem is sure to create much amusement.

To Tie a String With Your Teeth.

If well done this is a first-class trick. Take a piece of cord about two feet long, and after tying the ends together arrange in the shape shown in the figure. Be very careful to do this without showing the loop. Now place your thumb and finger on the loop,



and ask some one in the company to cut both strings (close to where you hold them). This will leave what looks like two separate strings of equal length. Put the two ends including the loop in your mouth, and after removing the short piece of string with your tongue and putting it away carefully in the recesses of your mouth, remove the string, which will appear in one piece tied apparently as you intimated you would do.

Quibbles.

1. What is that which cats have, but nothing else has? (Kittens.)
2. Can you put one of your hands where the other cannot touch it? (On elbow.)
3. Can you place a pencil on the floor in such a way that no one can jump over it? (Put close to wall.)
4. Can you push a chair through a finger ring? (Put on ring and push chair with that finger.)
5. What word is that composed of five letters, from which if two letters are taken *one* remains? (Money.)
6. What makes more noise than a pig under a gate? (Two pigs.)

Fireside Mesmerism.

Take a gold ring — the larger the better. Attach the ring to a silk thread about twelve inches long. Fasten the other end of the thread round the nail joint of your right fore-finger, and let the

ring hang about half an inch above the surface of the table, on which you rest your elbow to steady your hand. Hold your finger horizontally, with the thumb thrown back as far as possible from the rest of the hand. If there be nothing on the table, the ring will soon become stationary. Place some silver, say three half-dollars, immediately below it, and the ring will begin to move backwards and forwards, to you and from you. Now bring your thumb in contact with your forefinger, and the movements of the ring will become transverse to their former swing. Or this may be effected by making a lady take hold of your disengaged hand. When the transverse motion is fairly established, let a gentleman take hold of the lady's disengaged hand, and the ring will change back to its former course. Instead of silver you can suspend the ring over your left forefinger with similar results.

The Wonderful Cups.

Upon the table place three pieces of bread, or any other eatable, at a little distance from each other, and cover each with a cup. After moving the cups about a little, take up one, and, removing the bread, put it into your mouth, letting the company see that you swallow it, then raise the second cup, and eat the bread which was under that; then proceed to the third cup in the same manner. Having eaten the three pieces, and having moved the cups about a little, ask any person in the company to choose which cup he would like the three pieces of bread to be under, and when he has made his choice of one of the cups, put it on your head, and ask him if he does not think they are under it.

For Ferryman.

A man and his wife, each weighing 150 pounds, with two sons, each weighing 75 pounds, have to cross a river in a boat which is capable of carrying only 150 pounds weight. How will they get across?

A Very Good Question.

A gentleman who owns four hundred acres of land in the form of a square desired to keep one hundred acres, also in the form of a square, in one corner, and divide the remainder equally among his four sons, so that each son should have his lot of the same shape as his brother's. How may this be done?

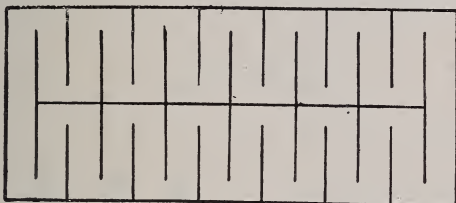
A Good Christmas Gift.

A gentleman whose daughter wanted some Christmas money, was asked if she would be satisfied with one cent on the first day of December, two cents on the second day, four on the third, and so on, doubling the amount each day until the last day of the month. She declined the proposition, as she thought the amount would not be sufficient for her wants. Now, what amount would she have received if she had accepted the offer?

To Cut a Hole in a Visiting Card

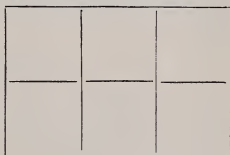
LARGE ENOUGH TO CRAWL THROUGH.

Take a card—a small one will do—cut it down the middle as shown in the Figure. Leave a small space uncut at each end. Then



fold and cut across from each side as shown in the figure. When the card is opened the "hole" will be large enough to pass through.

The Magic Square. With seventeen matches make six squares similar to diagram. Now the *puzzle* is to remove only five matches, and yet leave no more than three perfect squares of the same size remaining.



Wrinkles and Kinks.

Newspaper. You can place a newspaper on the floor in such a way that two persons can stand upon it and not be able to touch one another with their hands, by putting the paper under a door and requiring one to stand in each room on half the paper.

Problem in Money. Place ten half-dimes in a row upon a table. Then taking up any one of the series place it upon some other, with this proviso, that you pass over just one dime. Repeat this until you have lifted all the coins. Try it.

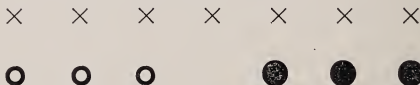
For Carpenters. There is a hole in the barn floor, just two feet in width and twelve feet long. How can it be entirely covered with a board three feet wide and eight feet long, by cutting the board only once in two.

For the Office Boys.

1. If $\frac{1}{2}$ of 6 be 3, what must $\frac{1}{4}$ of 20 be? ($7\frac{1}{2}$.)
2. Which is heavier, a pound of lead or a pound of wool?
3. What is the difference between half a dozen dozen and six dozen dozen?
4. Write down 13 in such a way that when half of it is rubbed out 8 shall remain. (XIII.)
5. Write 24 with 3 equal figures, none of them being 8. ($22 + 2$.)
6. What is the difference between twice twenty-five and twice five and twenty?

7. If you cut thirty yards of cloth into one yard pieces, and cut one yard every day, how long will it take? (29 days.)
8. What three figures multiplied by 4 will make exactly five?
9. What part of one-half square yard is one-half yard square? ($\frac{1}{2}$.)
10. What is that which is lengthened by being cut at both ends?

Japanese Puzzle.



By moving forward one move at a time, or by hopping over one man, as in checkers, in how few moves can the white man pass the black?

The Nine Digits.

1. Place the nine digits in the accompanying square, one digit to each division, in such a way that when added vertically, horizontally, or diagonally, the sum shall be always the same.
2. Take the nine digits and arrange them in a sum that (instead of making 45) will add up exactly one hundred.



Hanging Without a Cord.

Soak a thread in strong salt and water; dry thoroughly, and repeat this two or three times. This must be done privately beforehand. Make use of this thread to suspend a ring. Set fire to the thread, which will burn from end to end, but all will be surprised to see that the ring does not fall. The ashes will support it. Attach four pieces of thread to the four corners of a little piece of muslin, so as to form a miniature hammock. Soak the whole very thoroughly in salt water; then dry it. Repeat the operation three or four times. Place a blower egg in the hammock, then set fire to the muslin. If the experiment has been properly done the egg will remain.

A Good Problem.

Two men, A and B went to purchase some oil from C. A had a 5 gallon can, B a 3 gallon can, and C an 8 gallon can full of oil and no other measure. A and B want each 4 gallons. How can C measure it exactly, using only three cans?

For Young Mathematicians.

1. A Bedouin dies, leaving by will 17 horses to his 3 sons. To the oldest he leaves one-half his horses, to the next one-third, and to the youngest one-ninth. A dispute arising as to how the will can be carried out, without sacrificing one of the horses, the matter is referred to a dervish, who puts his own horse with the 17, then gives the half of 18 to one son, one-third to another, and one-ninth to the last, and then takes his own horse again.

2. Divide 2 by 5 so that the result will be 1000.

3. Place 15 sheep in 4 pens so that there will be the same number of sheep in each pen.

4. Ten travellers come to an inn and demand each a single room. The host says, "I have only 9 rooms, but I think I can manage it." He said to one, "Will you wait here until I have placed your friends?" He then put the 2d in the 1st room, the 3d in the 2d, the 4th in the 3d, the 5th in the 4th, the 6th in the 5th, the 7th in the 6th, the 8th in the 7th, the 9th in the 8th room, and he then returns for the last man and puts him in the 9th room.

5. Arrange 5 numbers, none of which are greater than ten, so that when read from left to right the one on the right will always be nearer to 10 than the preceding one, and the first number will be nearer 10 than the fifth.

Conundrums.

1. A visitor passing through a jail said to one of the prisoners, "Brothers and sisters have I none, yet this man's father was my father's son." What was his relation to the prisoner?

2. What makes a leopard spotted? (Ans. The spots.)

3. A boy on entering a room is told, "My son, bring me my boots." The boy replies, "It is true I am your son, but you are not my father, and, until you can tell me how this can be so, I won't bring you the boots."

4. Why should travellers over the great desert never want for food? Because of the *sand-which-is* there.

Magic Square.

Arrange the numbers from 1 to 16 in a square, so that the sum of the figures in any row, vertical, horizontal, or oblique, will be equal to 34. According to M. Ferniele, whose work on magic squares was published in 1698, there are 20,922,789,888,000 possible arrangements of the figures 1 to 16 in a square, and 878 arrangements that will form a magic square.

Peculiar Properties of the Numbers 37 and 73.

The number 37 is one which, being multiplied by each of the figures of arithmetical progression, 3, 6, 9, 12, 15, 18, 21, 24, 27, all the products which result from it are composed of three repetitions of the same figure; and the sum of these figures is equal to that by which you multiplied the 37.

37	37	37	37	37	37	37	37	37
3	6	9	12	15	18	21	24	27
111	222	333	444	555	666	777	888	999

The number 73, multiplied by each of the numbers of arithmetical progression, 3, 6, 9, 12, 15, 18, 21, 24, 27, the six products which result from this multiplication are terminated by one of the nine different figures, 1, 2, 3, 4, 5, 6, 7, 8, 9. These figures will be found in the reverse order of that of the progression.

A decorative banner with a textured, slightly wrinkled appearance. It is held up by two ropes or cords that cross at the ends. The text "PRACTICAL LESSONS" is written in a bold, sans-serif font at the top. Below it, the word "IN" is written in a smaller, similar font. At the bottom, the word "DRAWING" is written in a large, stylized, outlined font with a slightly irregular, hand-drawn feel. The entire banner is set against a background of fine, cross-hatched lines.

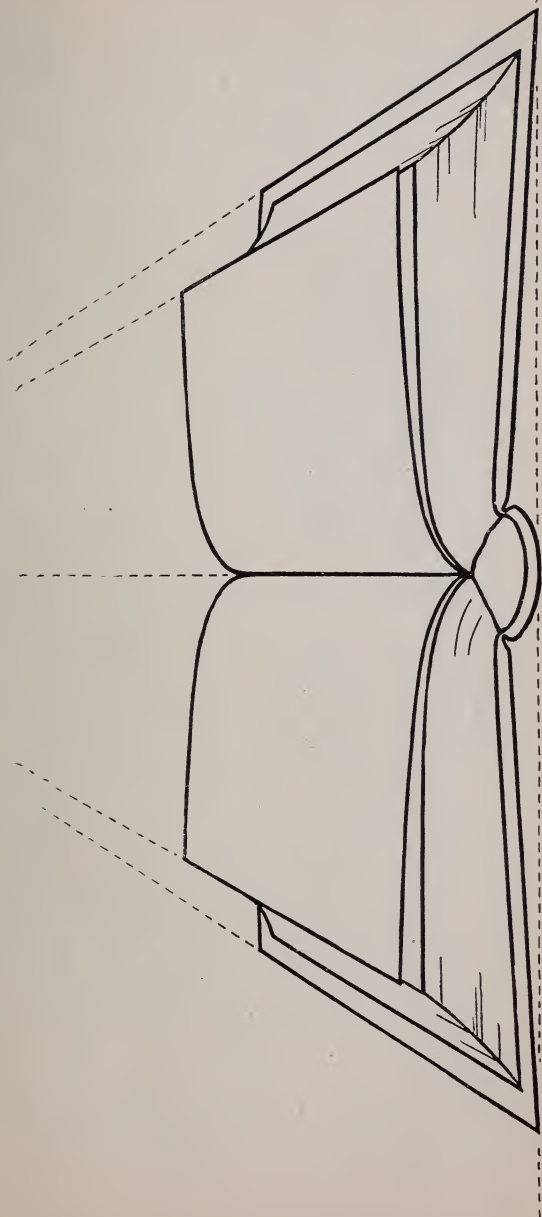
There is only one perfect way of learning to draw, and that is to begin at the very beginning; think nothing too unimportant, and, above all, never grow impatient, no matter how slowly you seem to be getting on. The following hints and suggestions will help you.

Materials. Get a good HB pencil to begin with. Be particular also about your india-rubber and your paper. The sponge rubber is the best. For ordinary work cartridge paper is good enough. You must have a drawing board and thumb tacks. Until you have learned outline work thoroughly you will not need any other materials.

Lines and Curves. Your first exercises should consist of freehand work in straight and curved lines. You should not leave this work until you are able to draw perfect perpendicular and horizontal lines, and to draw parallel lines with equal spacing. A good artistic line should never penetrate or impress the paper. Practise drawing graceful curved lines.

From Nature. Pick a fresh, green leaf from the nearest tree or bush, and having laid it before you, try to copy its curved border and well marked vein-lines. Next take a small branch with perhaps three or four leaves attached. After this get hold of a bare branch and set it up before you. (See opposite page). You will be astonished as you study it carefully how very beautiful it is in the intricacy and variety of its details and graceful gradations of taperings and twistings. Your next study should be a stalk of grass or grain. Pluck up one as near the root as you can, and set to work upon it while it is wavy and fresh. Now select any simple subject such as a bunch of apple blossoms, a lily, or an old tree.

Rules of Perspective. Directly opposite your eyes, as you look straight out, and on a level with your eyes, is your point of sight, or the centre point of your landscape. An imaginary line passes from your eye to this point of distance. This is called your first or centre line. It is made straight out from you, or perpendicularly from your standpoint, that is, from the bottom of your paper to the point of sight. Across the paper, and on a level with your point of sight, you



draw a horizontal line, which represents the horizon. This line governs all the rest, because all objects above that line you look up to, and objects below that line you look down upon. So you have, as the nucleus of your landscape, the standpoint, point of sight, perpendicular line of sight, and the horizontal level line. All other lines vanish into the point of sight. Practise perspective by drawing an ordinary square box, showing one side and the top. Every object in drawing, no matter what its position, must be governed by these fixed rules of perspective. If in your landscape there is a tree thirty feet high in the foreground and another the same height a quarter of a mile away, you are absolutely sure to get these two trees proportionately correct in your drawing if you draw according to the laws of perspective. You may have any number of *accidental* points of sight according to the number and position of the objects to be drawn.

Measurements. To measure exactly, you must close one eye, and hold your pencil out at the full extent of your arm firmly in your clenched fingers, using your thumb to mark off the length upon the pencil as you look past it with one eye at the object you are measuring.

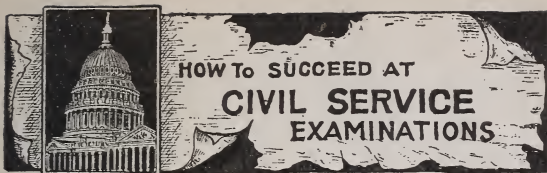
The Human Face. A man's head is four nose lengths; thus, from the top of the crown to the forehead, one; forehead, one; from nose to foot of chin, one. The width of a face should be two-thirds of its length, or two nose lengths. The width and diameter of the neck should be two nose lengths. The ear is one nose length, and should be horizontally on a line with the nose. The space between the eyes should be half a nose length. The centre of the eye ball should be perpendicular with the extreme ends of the mouth.

Shading. Pencil shading is the most delicate and valuable if it is done properly. To be a success it should either be hatched, stippled, or laid on the paper so lightly that the natural grain appears even in the darkest shadows. The india rubber should not be used. To *hatch* is to produce a shadow by broken lines crossed at angles; to *stipple* is to produce a shadow by dots. A round ball is the best object to practice shading from. Place it where the light falls on one side leaving the other in a deep shadow, and try to get the gradations and softness shown in the real object.

Charcoal. With a piece of charred vine-branch, which you can buy in any art store, you can reach the highest point which black and white can produce. It is easily erased, can be worked about as you like, is







GENERAL INFORMATION.

It is pretty generally known, that to secure a position in the departmental, postal, or customs service it is necessary to pass successfully a **civil service examination**. The examinations are held in all the large cities at stated intervals, and any citizen of the United States who fills out the necessary blanks satisfactorily, may be an applicant for examination. More than two thirds of the positions are open to both men and women.

There are **five branches** of the classified civil service:

1. The departmental service.
2. The customs service.
3. The postal service.
4. The railway mail service.
5. The Indian service.

No person who is an **applicant** for examination, or who is an **eligible**, in one branch of the classified service, shall at the same time, be an applicant for examination in any other branch. The commission may refuse to examine a candidate who would be **physically unable** to perform the duties required. For blanks and full particulars regarding departmental, railway mail, or Indian service examinations write to the **U.S. Civil Service Commission**, Washington, D.C. The application forms for customs and postal service are supplied by the local Civil Service Secretary at any large customs house or post office.

DEPARTMENTAL EXAMINATIONS.

The departmental examinations are intended to test the fitness of applicants for admission to the **classified departmental service** at Washington. The examinations are held at regular intervals in central

cities in every State of the Union. The **appointments** of successful candidates must be apportioned among the several States, so that a candidate who writes in Oregon has as good a chance to secure an appointment as one who writes in Pennsylvania or, for that matter, in the District of Columbia.

Copyist. \$900 per annum, and under. Subjects—Spelling Penmanship, Copying, Arithmetic (to percentage).

Clerk. \$1000 per annum, and upward. Subjects—Spelling, Copying, Penmanship, Arithmetic, Easy Book-keeping, Grammar, Letter Writing, U.S. Geography, History, and Civil Government.

Special and supplementary examinations are held for places which require certain technical, professional, or scientific knowledge. Applicants must be not younger than **twenty** years. Papers are graded on a scale of 100. To be eligible the candidate must secure a general average of at least 70 per cent. **Vacancies** in the classified departmental service, unless among the places excepted from examination, if not filled by either promotion or transfer, are filled from the lists of eligibles from each State, those standing highest taking first preference.

CUSTOMS EXAMINATIONS.

To test fitness for admission to the classified **customs** service, examinations are provided as follows:

Clerks. Subjects—The same as for clerks in the departmental examinations.

Day Inspectors. Subjects—Spelling, Copying, Penmanship, Arithmetic, Grammar, Geography of America and Europe.

Gaugers. Subjects—Spelling, Copying, Penmanship, Practical Arithmetic, Practical Tests.

Examiners. Subjects—Spelling, Copying, Penmanship, Arithmetic, Grammar, Practical Questions and Tests.

Such **other competitive examinations** as the commission may from time to time determine to be necessary are held to test fitness for other positions in this service. The marking of the papers is very similar to the method adopted in the departmental examinations.

POSTAL EXAMINATIONS.

To test the fitness for admission to the classified **postal** service, examinations are provided as follows:

Clerks. Subjects—Spelling, Copying, Penmanship, Arithmetic, Grammar, Letter Writing, Geography, History and Government of the United States, Reading Addresses, Physical Tests.

Carriers. Subjects—The foregoing (without History and Civil Government). Also knowledge of the locality of the post-office delivery.

Messengers. Subjects—Spelling, Copying, Penmanship, Easy Arithmetic, Physical Tests. This examination is used also to test the fitness for junior clerks, stampers, and other positions the duties of which are chiefly manual.

No person shall be examined for the position of clerk who is under eighteen. Carriers must be at least twenty-one, and junior clerks, sixteen. **Full information** regarding these examinations, including blank applications, can be had at any large post office.

Railway Mail Service. Send to the "United States Civil Service Commission, Washington, D.C." for full particulars, including sample questions, and dates of examinations in the several cities.

Indian Service. The classified Indian service includes all the physicians, school superintendents, school teachers, and matrons in that service. Send to the Commissioner of Indian Affairs for particulars.

SPECIMEN EXAMINATION QUESTIONS.

Note.—These questions are selected from actual papers. A large number of candidates are prepared annually for the Civil Service examinations by Boston Home College (Home-Study Department).

1. Spell the following words: Rarity, rarefy, silence, citation, inhabitant, diligent, ballot, balance, cough, coffee, erudition, resurrection, incapable, irresistible, deference, resistance, penitence, penniless, deficient, difference.

2. Write a letter discussing the following subject: The advantages of a common-school education to a business or professional man.

3. Correct these sentences: 1. He has been sick this

two years, but is now tolerable well. 2. No principle is laid down nor no rule given that apply to all possible cases. 3. Are not twelve month's travel in Europe better calculated to broaden one's ideas than any trip of equal length?

4. Express in the ordinary form: Fifty million one thousand and three and seven hundred and fifty millionths. 2. Twenty-seven pounds, twelve shillings, and six pence.

5. Write in figures: XCIXLXXIV.

6. The quotient arising from the division of 6,985.473 by a certain number is 51, and the remainder is 68.853, what is the divisor?

7. In going 1 m. 94 rods, 2 yds., 1 ft., a carriage wheel makes 526 revolutions. What is the circumference of the wheel?

8. On a note dated Oct. 16, 1891, for \$2,650, with interest at 6 per cent, the following payments were made: Jan. 28, 1892, \$575; May 22, 1892, \$25; and Aug. 4, 1892, \$943. What will be due Nov. 25, 1892?

10. Name in their order from east to west the States of the United States bordering on British possessions, exclusive of those separated wholly therefrom by a lake?

11. In or between what States is the mouth of each of the following rivers: Columbia, Cumberland, Missouri, James, Roanoke?

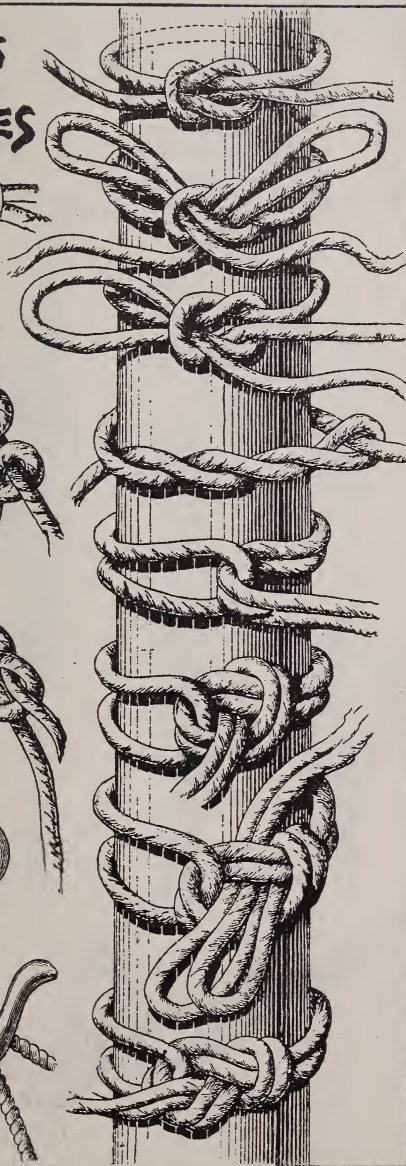
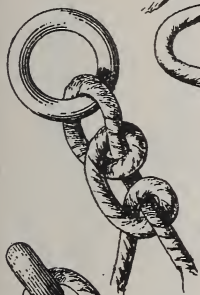
12. In what States and on what waters are the following cities: Fort Smith, Hartford, Montgomery, Cairo, New Haven, Bangor, Duluth, Nashville, Dubuque, Buffalo?

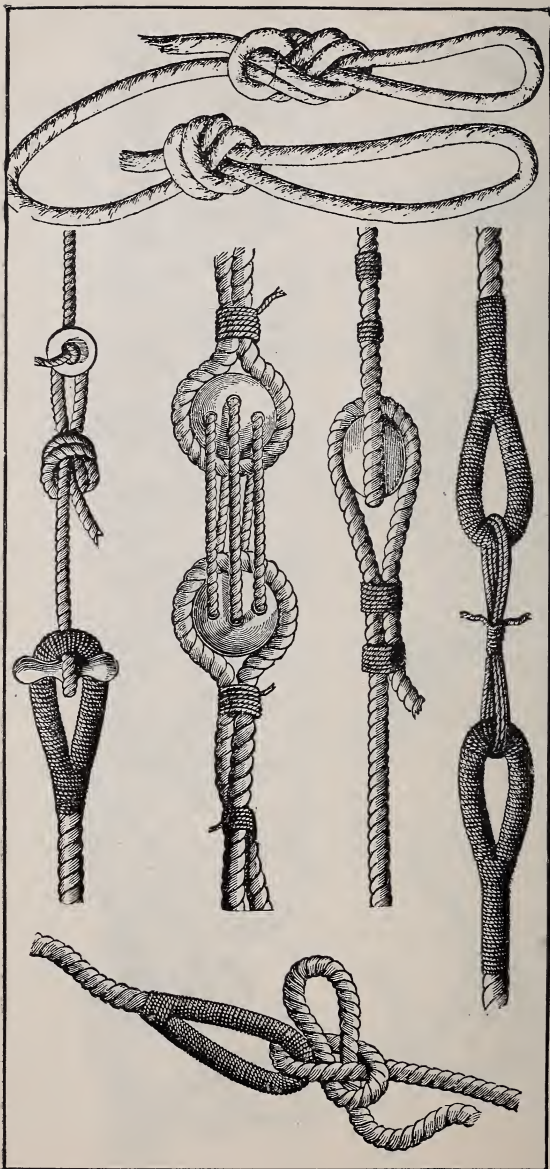
13. Name two important battles fought in Canada during the war of 1812. Who was President during that war?

14. For what purposes may the militia be called forth.

15. What are the constitutional qualifications requisite for eligibility to the office of President of the United States?

KNOTS AND SPICES





Handy Helps FOR BOOKKEEPERS

Renewed Notes. When a note is renewed the best way to record it is simply to make the memorandum in the bill book, marking out the old and entering the new. If something is paid on the note a journal entry may be made, or if the note has been discounted by us and we are obliged to take it up, a regular "double entry" is necessary.

Bills Receivable. It is well to remember that the difference between the two sides of this account should always equal the face value of the notes on hand.

Branch Houses. The books of branch houses should be kept the same as though the branch were independent, excepting that the parent house is credited with the net investment. When closing the books debit or credit the parent house with the net loss or the net gain.

Trial Balance Errors. If the difference is in round numbers, as \$100, or \$10,000, the error is likely one of addition. If the difference is divisible by 9, the error may be caused by the transposition of figures, as 72 for 27. If the difference is divisible by 2, the error may have arisen from posting an item representing just one-half the difference to the wrong side of the ledger.

New Partner. The customary way, when taking in a new partner, is to simply take an inventory and make a statement of the actual present standing of the old firm, not closing the books. It is considered better to close the books entirely when a new partner is admitted.

Change of Book-keepers. In taking a set of books from another book-keeper, begin by taking a trial balance to ascertain whether or not the books balance. They must balance before you can proceed.

C. O. D. Sales. When we ship goods C. O. D., or ship them and draw at sight as soon as they are shipped, we charge the person to whom shipped, and credit him when the money is received through express company or bank.

Statements. Better send out statements of accounts to all customers on the first of each month.

Receipting Bills. The word "Paid" is as good, and much shorter than "Received Payment." Many business houses use a rubber stamp which includes the date.

Ciphers. When an amount consisting of dollars and no cents is to be written in an amount column, do not write ciphers in the "cents" column. Better leave this column entirely blank.

Freight. Freight, cartage, express, and all similar expenses should be charged to merchandise. It may be more convenient to do this at the end of the year by closing an account representing these items into the merchandise account. Duty and custom-house charges should be treated in the same way.

Goods Returned. Credit the customers when the goods are returned. Debit a general account and at the end of the month close it into the merchandise account.

Entry Clerk. The duty of an entry clerk is to record sales in the sales book. The bill clerk makes out bills and invoices.

Handy Helps FOR Corresponding Clerks

Style. Paragraph and punctuate carefully. Spell correctly. Write legibly and with care. Avoid blots, erasures, and interlineations. Never economize in paper by writing cross lines. In writing to the most intimate friend, a certain degree of attention, both to the subject and the style, is requisite and becoming. It is no more than we owe both to ourselves and to the friend with whom we correspond.

P. O. Except in special instances, it is not necessary to write the letters P. O. after the name of the post-office. The letter, if it reaches the town, is not likely to go to the court-house or jail.

Promptness. Be prompt in answering all letters, but be specially so in acknowledging favors and in business correspondence.

Recommendation. "It ought to be the pride of every man who writes a letter of recommendation to feel that his letter will have weight, because it is known that he recommends only the deserving and the competent, and recommends truthfully."

Titles. It is not customary with people of good taste to use any title in signing letters. *Rev.*, *Hon.*, and *Prof.*, are prefixed to the names of gentlemen by others, but never by themselves, unless they are ill-informed of good usage. It is courteous, in addressing persons, to use their titles. The greater title presupposes the less; therefore, in the following omit the "Mr." and the "A.M.": *Mr. Thomas King, A.M., LL.D.* Never write "*Mr. Charles Baird, Esq.*" Say: *Governor and Mrs. W. E. Russell; Hon. and Mrs. J. G. Thomas; Rev. Dr. and Mrs. K. M. King; Prof. and Mrs. F. Sanderson.*"

R. S. V. P. These initials stand for *rezpondez, s'il vous plait*, (answer, if you please). They are sometimes written at the lower left-hand corner of invitations.

Official Letters. In official correspondence it is better to address the office than the officer, as "To the Secretary of the Navy, etc., Sir," instead of "To the Hon. B—— K——."

Order Letters. In ordering goods or any article, state explicitly the amount, kind, etc., and on what

terms wanted. Always state in your letter the amount of money you send and how you send it.

Paging. If the letter consists of more than one sheet, the sheets should be arranged in order and paged carefully.

Paper. For social correspondence, four-page *note* size is preferable. Business men generally use single sheets *letter* size, with printed business headings. The paper should be, whether letter or note size, the best that the writer can afford. Let it be white, or with the faintest tinge possible of blue or cream. Unruled paper is to be preferred. The names of the various kinds of paper in general use are *Legalcap*, *Bill-paper*, *Fool-cap*, *Letter-paper*, *Commercial-note*, *Note-paper*, and *Billet*.

Invitations. Invitations are usually written in the third person. They are usually short, and occupy the middle portion of a double sheet of note or invitation paper. The words "present their compliments" are now usually discarded from notes of ceremony.

Initials. Many persons, in subscribing their name, have a fancy for giving only the initials of their first, or given name; thus, R. Brown, J. T. King. No one can determine from these signatures whether the writer is Reuben or Rebecca, James or Juliet, and the person addressed, who is often a stranger, is at a loss whether to send his reply to Mr. Brown or Miss Brown, Mr. King or Miss King. This is especially the case if the penmanship has the appearance of a lady's hand.

Introduction. *Letters of Introduction* are used to introduce one friend to another who resides at some distance. Do not give a letter of introduction to any one with whom you are not thoroughly acquainted. Such letters are generally left unsealed, and the name of the person introduced should be written on the lower left-hand corner of the envelope, in order that the persons, on meeting, may greet each other without embarrassment.

Junior. The abbreviation of the word is "Jr." or "Jun." Its place is immediately after the name, as "William Brown, Jr., Esq." It never takes the place of any title. The same rule applies to *Senior*. Both words should begin with capitals.

Date. The date consists of the month, the day of the month, and the year. It is not necessary to write

the forms 1st, 7th, 23d, etc.; the figures are sufficient. Note that the proper contractions of the ordinals ending in 2 and 3 are 2d, 3d, 22d, 23d.

Degrees. Scholastic degrees — M.D., D.D., M.A., A.B., etc., — are always abbreviated in addresses. Titular addresses of high rank, however, such as President, Governor, Archbishop, etc., should never be abbreviated in such use. It is not in good taste to address a man as "Mr. Charles King, M.A.," or "Charles King, Esq., M.D." Titles are multiplied on title-pages and catalogues, but not more than one should appear on letters.

Folding. A letter-sheet should be folded from the bottom forward, bringing the lower edge near to the top, so as to make the half-length a little shorter than the envelope, and then break the fold. Next fold twice the other way, beginning at the left edge, folding towards the right. Measure these folds also, so as to fit the envelope. A note-sheet should be folded twice, from the bottom forward. When the envelope used is nearly square, a single fold of the note-sheet is sufficient.

Abbreviations. Avoid abbreviations, such as "&" for "and," "X Roads" for "Cross Roads," "Balt." for "Baltimore," "Phil." for "Philadelphia," "C'wood" for "Collingwood," "Wms'town" for "Williamstown," "Jns'town" for "Johnstown," "ad." or "adv." for "advertisement," etc.

Address. Write your name and address plainly and in full. What you intended for "N.Y." may look to the corresponding clerk who reads your letter like "N.J." Contractions of names should be made distinct.

Business letters should be clear, brief, direct, and gentlemanly. Everything irrelevant to the business in hand should be excluded. If necessary, reference should be made to former correspondence. Every business man should keep an exact copy of all business letters which he despatches, and file all business letters which he receives.

Carelessness in spelling, blunders in construction, or want of taste in the expression of thought, often interfere with success in the business world. The business character of a man is judged of by strangers from his correspondence.



NOTE. — George Cary Eggleston in a little book on "How to Make a Living" gives some excellent advice to young people on the subject of choosing an occupation.

The **choice of a business** determines the life of a man. It limits him on every hand, moulding him physically, intellectually, and even morally. It determines how much and what kind of work he shall do, how much leisure he shall have, what his associations are to be, and in many other ways affects his daily life to its end, and shapes his character far more certainly than his previous education has done. To choose wisely is to avoid more than half the errors which embitter human life.

The **first point** to be considered in the choice of a business, is your ability to earn a proper livelihood in its pursuit. The laborer is worthy of his hire. The world does not owe you a living, but you owe it to the world to earn a living for yourself. The world is entitled to your best work, and in choosing a life business you should choose the one in following which you are likely to do your best work. No man has a right to spoil a good blacksmith or carpenter for the sake of making a poor physician, or clergyman, or attorney. There is a joy in doing the thing for which we are fitted, that no man can know whose work is less truly in harmony with his nature.

The market is **always overstocked** with middling work of all sorts, while first-class work in every department of human effort, is always so scarce as to command high prices. Every employer knows that when he has need of a man capable of really first-class work, he must search diligently for him, and pay him a high price when he is found.

A large percentage of **life's failures** are due to people's persistent attempts to do things for which they are not fitted. A blunder of this kind at the outset is almost sure to embarrass one through life. The trouble comes mostly from a mistaken notion of respectability. One kind of labor is as respectable as another if it is honest labor and the world demands it. However, there is genuine dignity and honor in the pursuit of callings requiring intellectual strength and culture or technical knowledge and skill.

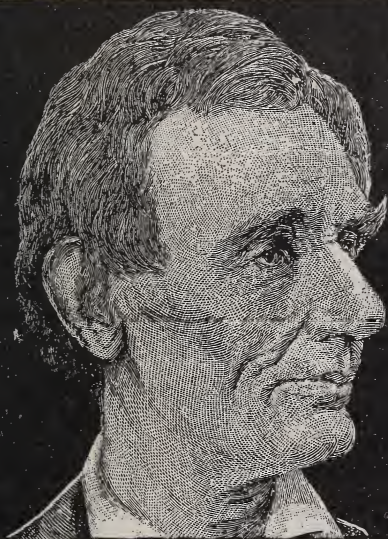
There is a prevalent belief among men that there are

more and **better chances** for advancement in the professions and in commerce than in mechanical pursuits. Young people ponder the stories of men who, beginning as office boys, have become chief clerks, junior partners, and ultimately seniors in great houses, until these come to represent, in their eyes, the ordinary and probable course of affairs. They forget that success of this kind can come to but one man in two or three thousands, and that when it does come it is the result of something more than mere chance. To a young man with capital in reserve, or with its equivalent in influence, or, better still, with extraordinary capacity, a clerkship may offer a reasonable prospect of ultimate advancement, but without one or another of these conditions, the chances are more than a thousand to one that he will never succeed in making more than a bare support for himself, while the overcrowded condition of the ranks in which he stands makes his position a precarious one always. The **mechanic**, on the other hand, brings a definite skill to bear upon the problem of money making. Only those who are similarly skilled can compete with him for employment. His skill is a positive capital, and his work is always productive.

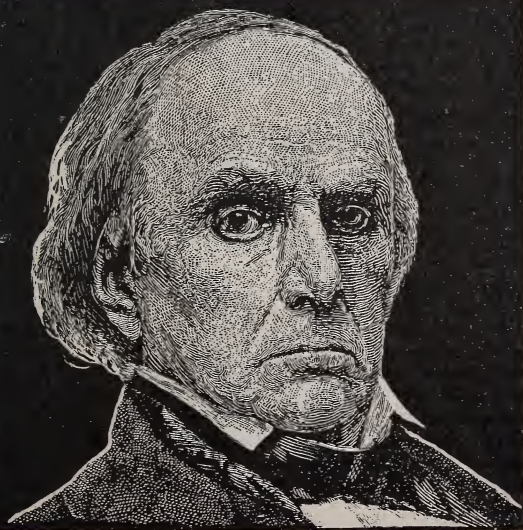
The era of **easy money getting** is rapidly passing away. In trained ability is there only any real safety from want. No man who is without a thorough knowledge of some business is ever safe. The work of developing our country's resources is only fairly begun, but it is so well begun that only skilled labor is wanted in its further accomplishment. The indifference with which young men habitually allow themselves to drift listlessly into avocations for which they are by nature unfit; the confidence with which they trust chance to do for them that which they should do for themselves; and the blind recklessness with which they neglect to acquire a skill that may serve them in their life struggle, is very much to be regretted.

Don't wait until you get **something to fit you**. Better get at something which doesn't fit, than to be idle. But all the while study your *bent*. Go-at-it-iveness is the first condition, and stick-to-it-iveness the second.

There are **Christian conditions of success** which all should consider. The merchant who is honest that he may make money is not honest and may fail. He only is Christian who counts honesty of more worth than money or fame. No matter what your calling, be truly true and faithfully faithful, and if you fail in the "hundred-fold now, in this time," it will be abundantly made good in the "life everlasting."



WELL-KNOWN FACES : WHO ?



How To Mark the Prices of GOODS

MOST APPROVED METHOD.

There is a wide diversity in the methods adopted by merchants for marking the cost and selling prices of goods. Some merchants are careless and inaccurate, and others fail in having as good a system as might with advantage be followed. It is obvious that the marks should be as simple and complete as possible, while at the same time they should be of such a character as not to tell too much to the inquisitive customer. Suppose we take for a **key word**:

CUMBERLAND K
1 2 3 4 5 6 7 8 9 0 Repeater.

using **K** for a repeater, so that to express in letters \$1.50

(LD) Cue # $4\frac{1}{5}$

(BD) Lr # $1\frac{1}{8}$

(UDK) Mdk # $7\frac{1}{3}$

we have **CED**, or \$3.00 we have **MDK**. Now, as a first example, suppose a piece of goods cost 70 cents and I want to sell it at \$1.25, the freight and other expenses being 10 cents: In marking the goods I should in the left-hand corner of the box put the New York cost, 70 cents, or **LD**,

with a circle around it. Now, I want to sell it at \$1.25. Near the middle of the box I should mark it \$4 $1/5$. This would show that 45 cents was the profit, and this is the way the mark would appear as in the first illustration. This **LD** with a circle around it represents the New York cost, 70 cents, the **Cue** the selling price, \$1.25, and \$4 $1/5$ the profit, or 45 cents. Take a second example. Suppose an article cost 40 cents, the freight was 17 cents, and we desire to sell it at 75 cents, the mark would appear as in the second illustration. If an article cost \$2 and I want to sell it at \$3 and the freight was 27 cents, I should mark it as in the third illustration.

FAMOUS AUTOGRAPHS



John Lubbock

Quinby

Mirabaud

Hobbes

Donaghy

Sturges



MATERIAL.

Before beginning a course in mechanical drawing the student should have a good general knowledge of the elements of **geometry**. The instruments used need not be numerous, but should be of the best make and finish which the student can obtain. The following are absolutely essential:—

1. **A Drawing-board** with a perfectly level surface, and with its corners true right angles. Half-imperial is a very convenient size.

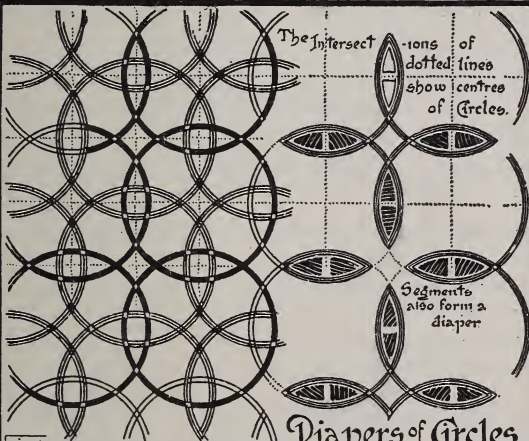
2. **A T square.**— This is used to draw lines parallel to the edge of the board. It is not advisable to use it for the purpose of drawing *vertical* as well as horizontal lines, as, if the board be not true, inaccuracies will be caused in the drawing. The *vertical* lines are best obtained by using the set square. It is advantageous to have the edge of the T square bound with hard wood and bevelled. The blade should be screwed on to the head, as this arrangement allows the set squares to be used more freely.

3. **Two set squares**, having angles of 45° and 60° respectively. These are used to obtain perpendiculars and parallels. Skilful manipulation of these useful instruments will enable the student to construct many simple figures by their aid alone.

4. **Pencils.**— These should be HH for the construction lines, and H for darkening the lines of the constructed figure. They are best sharpened like the edge of a *chisel* for geometrical drawing, as the point lasts longer.

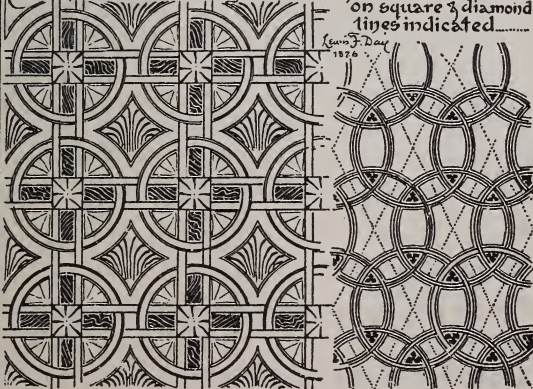
5. **Mathematical instruments.**— These should include: **A compass** with movable pen and pencil legs (those with needle points are preferable, as they do not make so large a hole in the paper); a pair of

DESIGNING



Diapers of Circles

Circles & cross lines interlacing.



dividers, for measuring; a **mathematical pen**, for ruling lines in ink. In addition to these, a set of *spring bow compasses*, for describing small arcs and circles, are of great assistance. **Indian ink** must always be used with the instruments, as it does not corrode them; that sold in a liquid form is very convenient. After the pens have been used they should be carefully wiped, to prevent rust.

6. Paper.—For ordinary pencil-work cartridge-paper is the most suitable; when the drawings have to be inked in, a better quality is desirable.

DEFINITIONS.

A line has *length* and *position*, but neither breadth nor thickness. Various methods of drawing lines are used in practice, as thick, thin, dotted, and chain lines.

A horizontal line is perfectly level, like the surface of still water.

A vertical line is perfectly upright, like a plumb-line.

An oblique line is neither horizontal nor vertical.

Parallel lines are the same distance apart, and cannot meet, however far they may be produced.

An angle is the inclination of two straight lines to each other, which meet together.

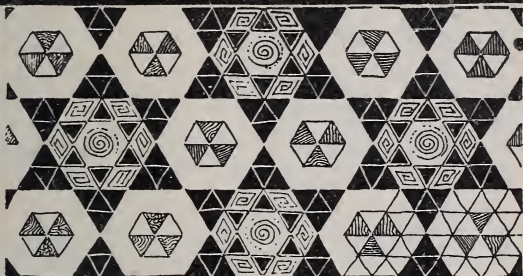
A right angle.—When two straight lines meet each other so that the adjacent angles are equal to each other, each of these angles is a right angle, and the lines are **perpendicular** to each other.

An obtuse angle is greater than a right angle.

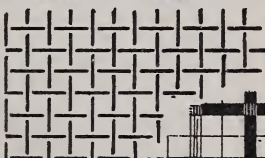
An acute angle is less than a right angle.

The vertex is the point where the two lines forming an angle meet.

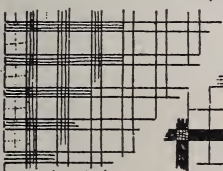
Adjacent angles have a common vertex and one common arm.



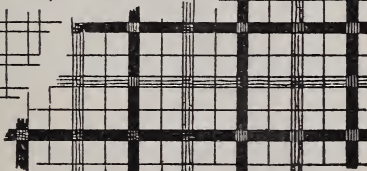
Cross lines Chess board



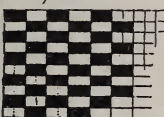
Lattice



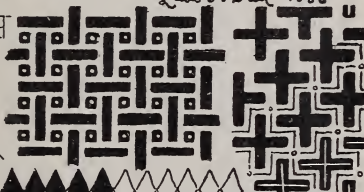
Plaids



Lewis F. D. an 1886



Plaiting

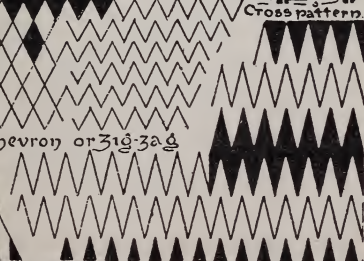


Cross pattern



Diamond

Chevron or Zig-zag



The complement of an angle is the difference between it and a right angle.

The supplement of an angle is the difference between it and two right angles.

Polygons are named according to the number of their sides : —

A pentagon has five sides.

A nonagon has nine sides.

A hexagon has six sides.

A decagon has ten sides.

A heptagon has seven sides.

An undecagon has eleven sides

An octagon has eight sides.

A duodecagon has twelve sides

A circle is a plane figure contained by one line, called the **circumference**. Every part of the circumference is equally distant from a point within the circle, which is called the **centre**.

The diameter of a circle is the straight line passing through its centre, and terminated at both ends by the circumference. It divides the circles into two **semicircles**. If two diameters be drawn at right angles to each other, the circle is divided into **quadrants**.

The radius of a circle is the distance from the centre to the circumference.

An arc of a circle is the portion between any two points in the circumference.

A chord is the straight line joining the ends of an arc.

A segment is the part of a circle bounded by an arc and its chord.

A sector is the part of a circle contained by two radii and the arc between them.

A tangent is a straight line which touches a circle, but does not cut it when produced.

Concentric circles have the same centre but different radii.

A triangle is a figure contained by three straight lines. If it be supposed to stand upon one of its sides,



Wave lines crossed
by horizontal bands
of large Rosettes

that side is termed its **base**; the point where the other two sides meet is its **vertex** or **apex**, the angle at the vertex is the **vertical angle**, and the perpendicular from the apex to the base or base produced is the **altitude**.

Triangles are named either from the comparative lengths of their sides, or from the magnitudes of their angles.

1st. *With reference to their sides there are three kinds:—*

An equilateral triangle has three equal sides.

An isosceles triangle has two of its sides equal.

A scalene triangle has three unequal sides.

2d. *With reference to the angles there are also three kinds:—*

A right-angled triangle has one of its angles a right angle. The side opposite to the right angle is called the **hypotenuse**.

An obtuse-angled triangle has one of its angles obtuse.

An acute-angled triangle has three acute angles.

A quadrilateral figure is bounded by four straight lines. It is also termed a **quadrangle**, from having four angles.

A parallelogram is a quadrilateral figure in which the opposite sides are parallel. The straight line joining the opposite angles of the parallelogram is called the **diagonal**.

A square has all its sides equal and all its angles right angles.

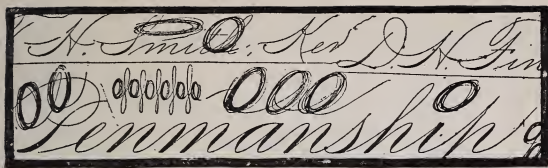
A rectangle or **oblong** has its opposite sides equal and all its angles right angles.

A rhombus has all its sides equal, but its angles are not right angles.

A rhomboid has its opposite sides equal, but its angles are not right angles.

A trapezoid has only two sides parallel.

A trapezium has none of its sides parallel, but may have two of its sides equal.



Note.— One of the best teachers of writing in the United States has prepared a course of home-lessons in penmanship which we unhesitatingly recommend to readers of this book. The work consists of a book of instruction and one hundred sheets of practice copies put up in a very attractive form. It is superior in every way to the old-style penmanship *compendiums* which have been so largely advertised. A set of these lessons can be secured, for one dollar, from Seymour Eaton, 42 Hollis St., Newton, Mass.

Material. Use good black ink and a moderately fine pen. Ordinary foolscap paper, having a moderately smooth surface, will do for practice.

Neatness. A very important part of the training of a good penman is the cultivation of a habit of neatness. It is certainly true that a lack of neatness is one of the principal causes of poor writing.

Position. It is very important that the hand should be accustomed to a correct position. The wrist should be nearly flat, thus bringing the penholder over to the left, so that it points about over the right shoulder. Let no part of the hand or wrist touch the paper except the third and fourth fingers, and these as nearly as possible on the finger nails. The penholder should be held about at the knuckle. The first and second fingers and thumb should be bent somewhat as the pen is held. The writer should sit facing the desk and should keep the head on a line with the body and not turned to right or left. The body should be nearly erect, but leaning slightly toward the desk and steadied by the left arm. The right arm should be kept so that the elbow is about at the edge of the desk.

Practice. Ordinary writing is done with the arm, hand and fingers, with the arm as the central, propelling force. The arm should always rest its full weight on the desk and should move on the muscular portion below the elbow as a kind of pivot but without sliding the sleeve. Poor writing is, as a rule, finger writing and a large part of the process of learning to write well is usually a training or discipline of the arm. No one can become a really good writer without learning to use the arm movement. Many fail here because as the result obtained at the start is not so good as that reached in the old way, the practice is given up. Movement exercises are for training or discipline, and this can only be reached by aiming at, or striving for a definite result. Reckless movement practice is worse than useless as it leads to carelessness in all writing. The right way must be faithfully followed until it becomes a habit. Training and discipline of the arm can only be had by using the arm. "Learning to write is a double process—the training of the muscles and the training of the eye—and neglect of either will result in failure.

L. G. Little,

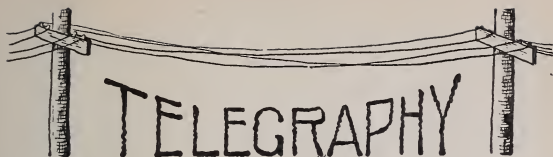
Scarborough.

P. P. Ranney.

At. Your
Name

Madaraiz.

Yours A. L.



Use. The electric telegraph is used to transmit messages by means of a recognized system of signals, from one place to another at a considerable distance apart.

Requisites. To transmit the message it is necessary to have

- (1) *batteries* to generate the currents;
- (2) *circuits*, or lines of wires connecting the two places;
- (4) *instruments* for sending and receiving the signals. In single needle instruments, these consist of
 - (a) *a commutator*, for sending the signals from one place;
 - (b) *a dial*, for receiving them at the other place.

Batteries. Daniell's battery is the one generally used. It consists of a teak trough which is divided into ten cells, separated from each other by slate partitions and coated throughout with marine glue. Each cell is divided by a porous partition into two parts. A zinc plate is connected by means of a copper strip with a copper plate, which passes over the top of the slate partition. The part of the cell containing the zinc is nearly filled up with water, and that containing the copper is partly filled with crystals of copper sulphate, upon which water is then poured to the same height. Pure water only is added in practice, because zinc sulphate is formed spontaneously in the cell if it be allowed to stand for about two days before use.

Circuits. Some years ago two lines were employed, one being used for the current to pass to the receiving station, and the other for the current to return to the battery. One wire only is used at the present time, each end of which is in metallic connection with a plate sunk to some depth in the ground.

The earth acts in a manner similar to the old return wire. It is unnecessary to consider that the same current returns to the battery, the earth merely dissipating the charge owing to the fact that it is at a lower potential than the place from whence the current starts.

Overhead wires are made of galvanized iron to prevent them from rusting, and are insulated by means of porcelain insulators, which are attached to poles or buildings.

Underground wires in towns are made of gutta-percha-covered wires placed in iron pipes.

Submarine cables in which great strength is necessary vary somewhat in construction, although the principle involved in each is the same. They usually consist of a *core* of seven copper wires, insulated by being covered with layers of gutta-percha. This is then covered with hemp, which in turn has a coiled sheath of steel wire placed round it.

The galvanometer consists essentially of a *coil* of fine silk-covered copper wire, in which is placed a vertical *magnetic needle* capable of deflection to the right or left according as a current is sent in one direction or the other round the coil. The magnetic needle is connected with a steel *indicator* placed in front of the dial. One terminal of the coil is in connection with the line, and the other in connection with the commutator to "earth."

The Dial. The two small circles on the face of the dial represent two *stops* (about one inch apart), which are placed in these positions to prevent the indicator, and the needle with which it is connected, being deflected too widely. The face of the dial has usually the *code of signals* printed upon it.

The commutator or *current-reverser* has two forms:—(1) The *drop-handle*, which, when hanging vertically breaks connection with the battery, but

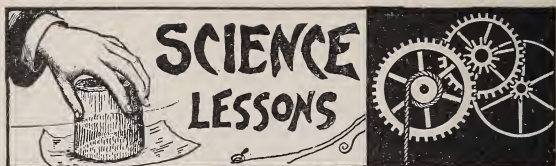
when moved to the right or left deflects the needle in those directions. (2) The *tapper* or *pedal*.

The Morse instrument is the one most used at the present time. It consists of (1) the *receiver*, and (2) the *transmitter*.

The Receiver. The essential part of the instrument consists of an electro-magnet, which, when a current passes round the coil, attracts an armature connected with a lever. It may be arranged as a *sounder*, in which case the person who is receiving the message notices the duration of the clicks. It may also take the form of an *embosser*, to print the signals upon a strip of paper moved by clockwork through the instrument. Receivers have been invented which print the messages in ordinary type-characters. These are being generally used in large offices.

The Transmitter consists of a brass lever movable about a horizontal axis. On pressing the knob the lever comes in contact with the button, connected with the positive pole of the battery, so that a current passes through the wire, the lever, and the line wire, to the distant station, the duration of which depends upon the time the lever is in contact, thus producing either a dot or a dash. When the pressure is removed a spring lifts the lever, until it touches a button at the other end and in connection with the wire (leading either to the indicator or to a relay).

The Relay. When a current has passed over a long distance its strength has fallen off considerably. It becomes necessary to introduce some contrivance which will give assistance by means of a local current. For this purpose a *relay* is introduced. This consists of a delicate electro-magnet, having a coil of very fine wire. When the weakened current passes round the coil, the electro-magnet attracts an armature, which closes a local circuit, in which a battery and receiver are included. Thus the weak line current brings into action a strong local current, which performs the necessary work.



Nature's Laws. Nothing in nature is permanent ; everything is constantly changing. Precisely the same effects are produced by the same causes. The invariable relations between causes and resulting effects constitute the laws of nature.

Molecules. All matter is conceived to be built up of minute particles, called molecules. Some idea of the extreme smallness of a molecule may be gathered from the estimate that if a drop of water were magnified to the size of the earth, its molecules, so magnified would be about as large as base-balls.

Inertia. All matter resists being set in motion, and, when moving, resists any change in the rate or direction of its motion. A ball thrown into the air, were it not for the attraction of gravity would go on forever.

Natural Forces. There are three great natural forces by whose varying action substances are gathered and held together. These forces are *gravitation*, *cohesion*, and *chemical affinity*.

Gravitation. By virtue of this force, each molecule of matter tends to attract, or pull toward itself, every other molecule, however distant. The earth is so enormous that it attracts all the detached bodies near its surface. This attraction is commonly called *weight*. The heavenly bodies attract each other. The attraction or lifting power of the sun and moon cause the tides. The intensity of gravitation varies inversely as the square of the distance between the bodies.

Cohesion, like gravitation, is an attractive force which may act on every molecule in nature. It acts only between individual molecules of the same kind of matter. It is this force which gathers molecules together in the form of solids and liquids.

Chemical Affinity. Cohesion increases the mass of a substance by adding together many minute particles of the same substance ; *affinity* produces a new substance by combining still more minute particles of

totally dissimilar substance. Air is composed of oxygen and nitrogen. Water is composed of oxygen and hydrogen.

Elements. An element is a substance which consists wholly of one kind of matter. There are about seventy known elements. Of these 55 are called metals, such as *calcium, iron, copper, gold*, etc. The remaining elements are called metalloids. Some are solids at ordinary temperatures, such as *silicon, carbon, phosphorus, sulphur*, etc. One is a liquid, — *bromine*. Others are gases, such as *oxygen, hydrogen* and *nitrogen*.

Compounds. Elements unite to form compounds, as air, water, quartz, limestone, etc.

Oxygen. This is by far the most abundant element on the earth. At ordinary temperature it is a gas — colorless, tasteless, and odorless. It is essential to all life, both animal and vegetable. It forms $\frac{1}{2}$ by weight of all rocks, $\frac{8}{9}$ by weight of all water, $\frac{1}{5}$ by weight of all air, $\frac{5}{9}$ by weight of all vegetable matter, and $\frac{2}{3}$ by weight of all animal matter.

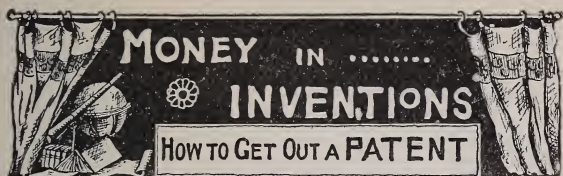
Energy. The quantity of work a body in motion is capable of doing, — or the amount of kinetic energy it possesses, — depends more upon the rapidity of its motion than upon its mass; for while doubling the mass only doubles the energy, doubling the speed increases the energy four times; thus, energy *increases with the mass of a body, but with the square of its velocity*. That is, a hundred-pound cannon-ball, moving with a certain speed, possesses no more energy than a one-pound ball moving ten times as fast.

Heat and Light are the results of a certain kind of insensible motion of the molecules of matter. A body is said to be hot when its molecules possess an exceedingly rapid, but, of course, invisible, vibratory motion. When this motion increases to a certain rapidity, the body becomes luminous, and is said to be red hot. The molecules are never supposed to be at rest. Unequally heated bodies, whether touching each other or not always tend to acquire a uniform temperature, the hotter becoming cooler, and the cooler becoming hotter. Heat is said to pass from one body to another in rays. Some of the rays emitted by a very hot body are perceptible to the nerves of the eye as light. Radiant energy travels through ether at the enormous speed of 186,000 miles a second, the heat and light of the sun requiring about eight minutes to reach the earth.

Expansion and Contraction. When a body grows hotter or colder, a change in its size always takes place. As a general rule bodies expand when heated, and contract when cooled. The power with which substances expand or contract is practically resistless. A change of temperature of 10° in a mass of air one mile square tends to change its length, breadth, and thickness by about thirty-six feet.

Freezing of Water.—Water, iron, and some other substances, occupy a greater space in the solid than in the liquid state, and hence do not expand and contract according to the general rule *when near their melting points*. If fresh water, for instance, be cooled, it contracts regularly, till it reaches a temperature of 39° , after which it *slowly expands as it cools*, until, in freezing, it makes a sudden and great expansion—twelve cubic inches of water making about thirteen cubic inches of ice. Ice is consequently lighter than an equal bulk of water, and hence floats. If the ice thus formed be further cooled, it will be found to contract regularly. Hence, it is only during the change from the liquid into the solid state that the general rule of expansion and contraction is reversed. This property of water is of great importance. Lakes and rivers cool in winter by radiating and conducting heat to the colder air. As the surface water cools and contracts, it sinks, and is replaced by warmer water from beneath, which in turn cools and sinks, until the whole depth of the water is reduced to 39° . Should this process continue until ice was formed, the ice, too would sink, and accumulate at the bottom until the lakes and streams were converted into solid blocks of ice, which the heat of the succeeding summer could not melt. But, after reaching 39° , the water *expands* by cooling until after ice is formed. Hence, the ice-cold surface water and the ice are lighter than the deeper water, and form a floating blanket, which prevents to a great extent the escape of heat from the slightly warmer water beneath, and so preserves it in a liquid state through the winter.

Velocity of Falling Bodies. When a body is allowed to fall freely from a state of rest it is found that its velocity increases regularly every second. During the first second it passes through 16 feet, and at the end of the first second it is traveling at the rate of 32 feet per second. During the second second it falls 48 feet, and the end of the second is traveling 64 feet per second. To find the space through which a body will fall in a given time, square the number of seconds and multiply by 16. To find the velocity in feet multiply the time in seconds by 32.



"The measure of impossibilities is lost in the present age." Only by **knowledge of Nature's laws** can man subjugate her powers and appropriate her materials for his own purposes. Such knowledge has lengthened life, mitigated pain, given new securities to the traveller, spanned great rivers, tunnelled mountains, lighted up the night with noon-day brightness, extended the range of vision, accelerated motion, and annihilated distance. A point which yesterday was invisible is its goal to-day, and will be its starting point to-morrow. Thus every new invention, every triumph of engineering skill, is the embodiment of some scientific idea. Machinery, actuated by the forces of nature, now performs with ease and certainty work that was formerly the drudgery of thousands. Every natural agent has been pressed into man's service.

But so much have these things become in **the present day** matters of course, that it is difficult for one who has not witnessed the revolution produced by such applications of science to realize their full importance. Let the young reader who wishes to understand why the present epoch is worthy of admiration, address himself to some intelligent person old enough to remember the century in its 'teens; let him inquire what wonderful changes in the aspect of things have been comprised in the experience of a single lifetime, and let him ask what has brought about these changes. He will be told of the railway, the steamship, the telegraph, the printing-press, the sewing machine, the telephone, and a hundred and one other wonderful inventions; he may hear of a chemistry which from dirt and dross extracts fragrant essences and dyes of resplendent hue; he may hear something of a wonderful instrument which can make a faint beam of light, reaching us after a journey of a hundred years, unfold its tale and reveal the secrets of the stars.

The rush of **inventors** to the patent office, and the perhaps larger number who have invented something and not got so far as the patent office, proves how copious is the store of inventive capacity among us. Immense fortunes have been made out of apparently trifling inventions—such as a shoe-fastener, a hook-and-eye, a machine for making square-bottomed paper bags, a window fastener, a monkey-wrench, a lamp-burner, and hundreds of other things just as simple.

The consideration of these inventions brings very forcibly home to the mind how simple are some of those methods which nobody seems to have thought of before, and yet which everyone finds so obvious and natural when they are once explained. The youth who imagines that invention is simple luck, a sudden happy thought, may as well dismiss the idea at once. Certainly some great thoughts appear to come suddenly and illumine all at once questions previously dark, but this is the exception. It is almost invariably found that the inventor has long been thinking upon the question leading to the invention, and, perhaps, has made many unsuccessful attempts to solve the problem.

How to Get out a Patent.

Patents are granted in the United States for a period of seventeen years. The inventor or discoverer must make a written application addressed to the **commissioner of patents**, and file in the patent-office a written description of his invention or discovery, giving details of its various parts, the materials used, how constructed or compounded, the manner of operating it, and the results proposed to be accomplished by its use. The specifications must be signed by the inventor and be attested to by two witnesses. When the character of the application requires drawings of machinery, or parts thereof, the applicant must furnish one copy of each drawing for filing in the patent office, and another to attach to the specifications. If the article to be patented is compounded of several ingredients, specimens of the materials used, and of the whole composition must be forwarded with the application. When a machine for which a patent is asked can be illustrated by a working model, the commissioner may require the applicant to furnish such model. All patented articles must be marked "patented" before being sold. It is a punishable offence to put this word upon any article which has not been patented. For circulars giving full information on all points, address the Commissioner of Patents, Washington, D.C.

Trade Marks.

A **trade mark** is an arbitrary sign, name or symbol, by which a manufacturer marks his goods, and by which they are known in the market as his. Trade marks may be registered by the commissioner of patents, giving the person or firm exclusive right to use them. The term is thirty years, and may be renewed for a second thirty. No one may use the patented trade-mark of another on a similar class of goods, neither can he use anything so closely resembling the trade-mark as to deceive customers. The same mark may be used for another class of goods without infringement. The fee is twenty-five dollars.

To Obtain a Copyright.

To obtain a **copyright** the applicant must, on or before the day of publication in this or any foreign country, deliver at the office of the Librarian of Congress at Washington, or deposit in the mail, addressed to the Librarian of Congress, a printed copy of the title of the book, etc., for which he desires a copyright. He must also immediately after publication, forward two copies of the book, etc., printed from type set within the United States, or from plates made therefrom. The fee is one dollar. Copyrights remain in force for twenty-eight years, and may be renewed for fourteen years. Write to the Librarian of Congress, Washington, D.C., for further particulars and for application forms.



In this department we give the French of a few very common words and expressions. We have spelled the French words as they are pronounced and not as they appear when printed.

1. If you please — *See voo play.*
2. Yes, sir — *Wee Mosseeu.* No — *Nong.*
3. I thank you — *Jeh voo remmairsee.*
4. Do you speak French? — *Parlai-voo fraunsai?*
5. I do not understand — *Jeh neh compring pah.*
6. Give me. Bread. Coffee.
Donnai mwa. pang. du caffay.
7. Good morning. Very well.
Bong joor. Tray beeang.
8. How do you do? — *Commong voo portaivoo.*
9. Goodbye — *O playzeer.* Goodnight — *Bon nwee.*
10. I think so — *Je crwa queh wee.* Not — *nong.*
11. I am very glad of it — *Jong swee fort aze.*
12. Don't answer — *Neh raipleekai pah.*
13. How old are you? — *Kel ahje avai voo?*
14. What do you say? — *Keh deet voo?*
15. Do you understand me? — *Meh Compramay voo?*
16. Come here — *Approshai.* Listen — *Aicootai.*
17. What do you mean? — *Keh voolai-voo deer?*
18. Do you know Mr. H?
Connaissai voo mosseeu H?
19. What o'clock is it? — *Kel eur ait-eel?*
20. Make haste — *Neh swoyai pah longtong.*
21. Not very well — *Pah tray beeang.*
22. Is breakfast ready? — *Leh daijennay ait eel pray?*
23. That is enough — *sla ait assay.*
24. Give me the salt — *Donnay mwa leh sel.*
25. Pass me the butter — *Passay mwa leh beur.*
26. Not to-day — *Paz vjoordwee.*
27. We shall dine at six — *Noo deenerongs ah seece.*
28. Help yourself — *sairvai voo.*
29. Potatoes — *Dayz pom deh tare.*
30. I am hungry — *J'ay fang.*

31. I am very thirsty — *J'ay beeang sonaf.*
32. They are waiting for you — *Ong vooz attong.*
33. Ring, if you please — *sonnay, see voo play.*
34. Are you tired? — *Ait voo fateegay?*
35. Is my room ready? — *Ma shawmbr ait-el prate?*
36. Good night — *Bong swahr.*
37. Where shall we go? — *Par o eerong noo?*
38. I know him — *Jeh leh connay.*
39. Market. Street. Square.
Marshay. Ru. Plass.
40. I am very warm — *J'ay beeang sho.*
41. Do you think it will rain?
Crwoiyai-voo keel pleuv?
42. Light the fire — *Allumay leh feu.*
43. Put some coals on — *Mettay du sharbong.*
44. I want some paper — *Eel meh fo du papyai.*
45. Post this letter — *Portay set lettr ah lah post.*
46. Come with me — *Vennaze avec mwa.*
47. What are you doing? — *Keh fate voo?*
48. I am sick — *J'ay mal o kur.*
49. Everything is ready — *Toot ai pray.*
50. There is no room — *Eel nee ah pah deh plass.*
51. Give me your hand — *Donnay mwa lah mang.*
52. How much is it? — *Ah combeeang slah mongt eel?*
53. Do we stop here? — *Nooz ee arrayterong noo?*
54. Five minutes — *sang meenute.*
55. Here it is — *Leh vwoysee.*
56. Is your name on it? — *Votre nong ait eel dessu?*
57. Not that I know of — *Pah keh jeh sash.*
58. Which is the best hotel?
Kel ai leh melyure hotel?
59. Have you made out our bill?
Avay-voo fay notr cong?
60. Never mind — *Namport.*
61. Will you have some? — *Ong voolay voo?*
62. **The French numerals are as follows:**

1. <i>ung</i>	8. <i>wheet</i>	15. <i>kangz</i>
2. <i>deuh</i>	9. <i>neuf</i>	16. <i>sayz</i>
3. <i>troiah</i>	10. <i>deece</i>	17. <i>deece-set</i>
4. <i>kahtr</i>	11. <i>ongz</i>	18. <i>deeze-wheet</i>
5. <i>sahnk</i>	12. <i>dooze</i>	19. <i>deez-neuf</i>
6. <i>seece</i>	13. <i>trayz</i>	20. <i>vahng</i>
7. <i>set</i>	14. <i>katorz</i>	

Easy Lessons — in — German Conversation

In this department we give the German of a few very common words and expressions. The German words are spelled as they are pronounced and not as they appear when printed.

1. Yes — *Yah*. No — *Nine*.
2. If you please — *Geeyuligst*.
3. Sir — *Mine herr*. Miss — *Mine froyline*.
4. Do you speak German? — *Sprechen zee doytsh*.
5. Do you understand? — *Fertayen zee*.
6. Good morning — *Gooten morgen*.
7. How do you do? — *Vee gaytes*.
8. Very well — *Zare vole*.
9. Give me some water — *Gayben zee meer vasser*.
10. Good bye — *Layben zee vole*.
11. Good night — *Gooten nacht*.
12. No, thank you — *Nine, ich dankay eenen*.
13. How old are you? — *Vee alt zind zee?*
14. What do you say? — *Vas zaagen zee?*
15. What is it good for? — *Vo'soo ist es goot?*
16. What o'clock is it? — *Vas ist dee oor?*
17. Are you hungry? — *Zind zee hoongrig?*
18. Are you tired? — *Zind zee meeynday?*
19. Where shall we go? — *Vo vollen veer hingayen?*
20. Everything is ready — *Alles ist furetig*.
21. I want a ticket for — *Ich veeunspay ine billyet nach*.
22. Do we stop here? — *Halten veer heer an?*
23. Which is the best hotel?
Velches ist das bestay hotel?
24. Are our rooms ready?
Zind oonzere tsimmer fartig?
25. **The German numerals are as follows:**

1. <i>ine</i> .	8. <i>acht</i> .	15. <i>finftsane</i> .
2. <i>tsvi</i> .	9. <i>noyn</i> .	16. <i>zextsane</i> .
3. <i>dri</i> .	10. <i>tsane</i> .	17. <i>zeebentsane</i> .
4. <i>feer</i> .	11. <i>elf</i> .	18. <i>achttsane</i> .
5. <i>finf</i> .	12. <i>tsvelf</i> .	19. <i>noynntsane</i> .
6. <i>zex</i> .	13. <i>dreytsane</i> .	20. <i>tsvantsig</i> .
7. <i>zeeben</i> .	14. <i>feertsane</i> .	

Good Practical Questions.

1. Why is not the rain which falls near the ocean salt like the ocean?
2. Name a tree of the forest which produces a valuable article of food.
3. Name five animals which have *hoofs* and five which have *claws*.
4. If the country should become bankrupt which would be more valuable, a silver dollar or a dollar bill?
5. What part of the world is called the "Dark Continent?"
6. One of the continents has more people than all the others put together: which one is it?
7. Which way does the water flow at the Strait of Gibraltar—into the Mediterranean or out of it? (Into the Mediterranean. Why?)
8. What is the chief ruler called in Japan? Persia? Turkey? Russia?
9. In what part of the United States does the point farthest from the ocean water lie? Name the city of more than 25,000 population which is farthest from either ocean or the Gulf of Mexico.
10. Describe three important methods of growing and manufacturing sugar.
11. In what part of the world are the days and nights of equal length?
12. What change in the air is indicated when the mercury in the barometer has fallen an inch during a single night?
13. There is in the world a straight line of railway 400 miles long: what cities does it connect?
14. In what direction does the wind always blow at the south pole?
15. In a map of the world showing races and religions the Mohammedan countries are printed yellow: what portions of the map are this color?
16. Only two European capitals are on the open sea: name them.



Fireflies shine only when in motion.

Every tub must stand on its own bottom.

Things slowly obtained are long retained.

Buy nothing unnecessary, no matter how cheap.

Perseverance removes mountains, or tunnels them.

Doing nothing is an apprenticeship to doing wrong.

Nothing is so hard as to make a fortune dishonestly.

An unselfish, Christlike man is the noblest work of God.

Be sure you have a loaf, and not a stone, before you bite.

A bad promise is worse kept than broken, but better not spoken.

He who waits for something to turn up is likely to turn up in jail.

You can sell a good deal more than you do by filling up your measures.

Don't overwork to gain \$200 and then spend \$500 in regaining your health.

There is always work for skilled hands. "To him that hath shall be given."

Take people as they are, but not without an effort to make them as they should be.

A lazy man is of no more use in the world than a dead man and he takes up more room.

If you undertake to do a thing, do it. "Whatsoever thy hand findeth to do, do it with thy might."

Do your best every time, even in small matters. Whatever is worth doing at all is worth doing well.

Never make a promise which you cannot perform. Incur no responsibility which you cannot meet without distress.

When you open one hand to secure a new customer, be sure not to allow the old customer to escape from the other hand.

When a business is said to run itself, it is generally the result of the force of gravitation. Gravity is always downward.

Some of the meanest men that breathe are strictly honest, but they don't "do to others as they would they should do to them."

When you have made a fair success along a certain line, avoid deviating from it. The avenues of success are constantly narrowing.

It is hardly fair to represent Justice any longer with a pair of scales in her hands. Put the blind-folding on the customer and call it *injustice*.

When you seek to obtain credit in excess of the amount of your capital, you have crossed the prudent line which divides business from speculation.

The man who sent a four-gallon jug for molasses and received it back with a bill for five gallons, said that he didn't mind the extra gallon of molasses, but that he was afraid of the stress on the jug. Better be afraid of the stress on the conscience of those who weigh their goods by the false balance which is an abomination to the Lord.



The Correct Thing IN DRESS AND MANNERS

Remember that it is fully as entertaining to be a **good listener** as a good talker.—It isn't the correct thing to **pick your teeth** at the table, or for that matter, to have tooth-picks on the table.—A gentleman should be **introduced** to the lady, not the lady to the gentleman.—**Letters** of introduction should be given unsealed.—Gentlemen wear morning **dress** for all occasions before dinner.—Don't sandwich yourself between **two ladies** by taking their arms.—**Don't eat** candy, fruit, or anything, on the street, in the horse-car, or in any public place.—**Greet kindly** all who greet you.—Don't occupy **two seats** when others have to stand.—Don't discuss your **private affairs** except with your most intimate friends.—Don't **kiss the bride** except you are an intimate friend.—Don't chat across the street.—Don't mark the **wedding presents** with the bride's future name.—Don't carry your purse on your back: keep a little in your pocket.—Don't use **hair oil**, good, bad, or indifferent.—**Carry** the parcels for the young lady with whom you are walking.—Don't fail to **apologize** if you have said or done anything causing annoyance or trouble.—Don't make the door **swear** when you shut it.—Don't pour out your sweetest affection on a **dog** in a country where there are children.—It is not the proper thing to sign your **husband's name** prefixed by "Mrs." to a letter of any kind. When you marry you change your surname only.—**Answer** all **invitations**, but never on a postal or on business paper.—**Don't call** on a young lady unless you have asked permission to do so.—**Kind hearts** are more than coronets the world over.—Perform in the **domestic circle** the same courtesies which you

consider the proper thing to do in the circle of your acquaintances.—Untrained **characters** do not willingly submit to any rules.—Be specially considerate of **the aged**.—**Don't criticise**.—**Don't arrive** before you are expected.—The half-day before a visitor comes is the busiest of the week in a good many families.—**Never** interrupt, rarely give advice, and seldom ask personal questions.—**Don't pry** into other people's affairs.—As a rule, those who know most are most modest. Never make a **display of knowledge**.—He who **makes fun** of any branch of Christian faith lacks the Christian spirit.—Never **monopolize** conversation.—It doesn't take brains or heart **to find fault**.—It is the proper thing to **rise to your feet** when visitors enter; also when they are leaving.—The oldest residents in a city or street should **call first** upon the new-comers.—Make it a rule of your life to **praise people**, and do it without flattery.—“Rejoice with them that do rejoice, and weep with them that weep.”—It is a very common thing, but not the proper thing, to write a letter and **say nothing** in it.—It is considered the proper thing for a lady to sign her **last name and initials**, instead of her Christian name, when writing to a comparative stranger, to a young person, to a servant, or when writing on business.—The more **truly religious** a man is, the more polite he will spontaneously become, and that, too, in every rank of life, for true religion teaches us to forget ourselves, to love our neighbors, and to be kindly even to our enemies. There are no better rules of conduct than are found in the **sermon on the mount**.—The **golden rule** is the best rule in both society and business.—High moral character, a polished education, a perfect command of temper, delicate feeling, good habits, and a good bearing, are the **indispensable requisites** for good society.—Take Charles Dickens' advice and “**do all the good you can, making as little fuss about it as possible.**”



THE TITLE OF THE BIBLE.

The title of the **Bible** is of medieval origin. It is not found in Anglo-Saxon, though **Gospel** (God-spell or good-spell, i.e., story of God, or good story) has come to us from that tongue. The name Bible comes through the Norman-French from the Latin *Biblia*, which was treated in the Middle Ages as a feminine singular noun, though it was a mere transliteration of the Greek neuter plural *Biblia*, meaning *books*. In the Gospels, the Acts, and the Epistles, the *books* which were read in the Jewish synagogues are often entitled *the scriptures*. Sometimes *the law* seems to be used as a name which comprehends them all. Paul, in a notable passage, calls the books of Moses *the old covenant*. In the same context he describes himself and his fellow-laborers as “ministers of a *new covenant*.” Hence the two collections of writings which make up the Bible came to be called the Old Testament and the New Testament.

THE CANON OF SCRIPTURE.

Canon (Greek, a *straight rod*) is used figuratively of a testing rule in art, logic, grammar, or ethics. In the early ages of Christianity, the term was used generally to denote a standard of opinion and practice. To say that a book of the Bible is *canonical* is to signify that it is genuine. *Apocryphal* books are those of uncertain authority.

VERSIONS OF THE SCRIPTURES.

Greek. Of these the *Septuagint* occupies the highest rank. According to tradition, it was translated from the Hebrew by seventy-two Jews, each of whom, in a separate cell, made a complete translation of the entire Old Testament, and, when compared, these seventy-two copies were found to be so completely identical that they were deemed to be inspired.

Syriac. The *Peshito* version has been attributed to the first century after Christ. It contains all the canonical books of the Old Testament and most of those of the New. This version has been always accepted by all sections of the Syrian church as authentic, and from it several Arabic translations have been made.

Latin. The principal Latin version is known as the *Vulgate*. For the work of revision Jerome took up his residence at Bethlehem, and was occupied upon it for twenty-one years.

English. *Wycliffe* translated the New Testament from the Latin Vulgate. His followers added the Old Testament (1380). *Tyndale's* New Testament was printed in 1525. Translations were prepared also by *Coverdale*, *Cranmer*, and others. The *authorized* version was translated from the Hebrew and Greek (by order of James I.) by forty-seven divines, each taking a portion which was revised by the whole body.

GENUINENESS OF THE OLD TESTAMENT.

External evidence. The Jews, to whom these books were entrusted, have been in all ages unanimous in their testimony that the several books were written by the men whose names they bear. The authors, also, frequently quote one another as authoritative and genuine, and many of the books are so quoted by Jesus Christ.

Internal evidence. The writers, with few exceptions, profess to be Jews of Palestine, a people peculiarly separated from the rest of mankind by religion, by unique customs, and by physical position. These peculiarities are implicitly maintained throughout the whole books, and remain with the Jews until the present day. Except in Daniel and Ezra, the language is uniformly Hebrew, which ceased to be a living speech soon after the Babylonish Captivity. Some parts of Daniel and also of Ezra are written in Hebrew, others in a form of Aramaic. This phenomenon finds its explanation in the residence of Daniel and Ezra at Babylon. The records contain histories, frequent genealogies, and biographies, all of which are capable of more or less verification from other records.

GENUINENESS OF THE NEW TESTAMENT.

The existence and authority of the several books in the New Testament are attested by quotations in a series of Christian writers which begins with the immediate successors of the Apostles. There is no manuscript of the New Testament, or any part of it, extant which was written within the first three centuries. The oldest known manuscript is in Greek. It was found by Tischendorf in the convent of St. Catherine, on Mt. Sinai, in 1859. This MS. is now in the St. Petersburg Library. Other very old manuscripts are preserved in the British Museum, the Vatican Library, and other places.

DIVISION OF THE OLD TESTAMENT.

1. **The Pentateuch.**
The Five Books of Moses.
2. **The Historical Books.**
From Joshua to Esther, inclusive.
3. **The Poetical Books.**
From Job to the Song of Solomon, inclusive.
4. **The Prophetical Books.**
From Isaiah to Malachi, inclusive.

DIVISION OF THE NEW TESTAMENT.

1. **The Four Gosels.**
Two by Apostles and two by Evangelists.
2. **The Acts of the Apostles.**
Written by Luke.
3. **The Pauline Epistles.**
Ten addressed to Churches, three to persons.
4. **The Catholic Epistles.**
By James, Peter, John and Jude.
5. **The Revelation of John, the Divine.**

JEWISH PEOPLES.

The Galileans were a turbulent and seditious sect. Their leader was Judas, of Galilee, (Acts 5: 37) who attracted to himself a few Pharisees. They taught that all foreign domination was unscriptural.

The Pharisees were a religious party who affected very great sanctity. They were strict observers of the external rites and ceremonies beyond the requirements of the Law, placing the traditions of the elders on an equal footing with the written oracles. They were exclusive, formal, self-righteous; proud of their unblemished descent from Abraham.

The Proselytes were Gentiles converted to Judaism. The circumcised Proselytes were charged with the entire obligations of the Mosaic covenant.

The Publicans were a social class. They were the tax-collectors of the civil power, and as such were universally despised.

The Sadducees were the very opposite of the Pharisees. They denied the authority of all revelation and tradition subsequent to Moses. They gave themselves up to ease, luxury, and self-indulgence. They divided the hierarchy with the Pharisees.

The Samaritans were a mixed people, derived from the colonists whom the King of Assyria sent to inhabit the land of Samaria after he had carried the Israelites captive. These colonists brought with them their various forms of idolatry.



GOOD READINGS AND RECITATIONS

1. A Change of Local Coloring.

I knew a lass, her eyes were blue,
Her lips were red,
Her teeth were white,
And her hair was of a golden hue.

But now, alas! her lips are blue,
Her eyes are red,
Her hair is white,
And her teeth are of a golden hue.

For Father 'Time (*the mean old thing*)
Has changed the local coloring.

2. Whisperin' Bill.

So you're takin' the census, mister? There's three of us living
still,
My wife an' I, an' our only son, that folks call Whisperin' Bill;
But Bill couldn't tell ye his name, sir, an' so its hardly worth
givin',
For ye see a bullet killed his mind an' left his body livin'.

Set down for a minute, mister. Ye see, Bill was only fifteen
At the time o' the war, an' as likely a boy as ever this world has
seen;
An' what with the news o' battles lost, the speeches an' all the
noise,
I guess every farm in the neighborhood lost a part of its crop o'
boys.

'Twas harvest time when Bill left home; every stock in the field
o' rye
Seemed to stand tip-toe to see him off an' wave him a fond
goodbye;
His sweetheart was here with some other girls — the sassy little
miss!
An' pretendin' she wanted to whisper'n his ear, she gave him a
rousin' kiss.

Oh, he was a han'some feller, an' tender an' brave an' smart,
An' though he was bigger than I was, the boy had a woman's
heart.

I couldn't control my feelin's, but I tried with all my might,
An' his mother an' me stood a-cryin' till Bill was out o' sight.

His mother she often told him, when she knew he was goin' away,
That God would take care o' him, maybe, if he didn't fergit to
pray;

An' on the bloodiest battle-fields, when bullets whizzed in the air,
An' Bill was a-fightin' desperit, he used to whisper a prayer.

Oh, his comrades has often told me that Bill never flinched a bit
When every second a gap in the ranks told where a ball had hit.
An' one night, when the field was covered with the awful harvest
o' war,

They found my boy 'mongst the martyrs o' the cause he was
fightin' for.

His fingers was clutched in the dewy grass — oh, no, sir, he was'nt
dead,
But he lay sort o' helpless an' crazy with a rifle-ball in his head;
An' if Bill had really died that night I'd give all I've got worth
givin';
For ye see the bullet had killed his mind and left his body livin'.

An officer wrote an' told us how the boy had been hurt in the fight,
But he said that the doctors reckoned they could bring him around
all right.
An' then we heard from a neighbor, disabled at Malvern Hill,
That he thought in the course of a week or so he'd be comin' home
with Bill.

We was that anxious t'see him, we'd set up an' talk o' nights,
Till the break o' day had dimmed the stars an' put out the northern
lights;
We'd waited an' watched fer a month or more, an' the summer was
nearly past,
When a letter came one day that said they'd started for home at
last.

I'll never fergit the day Bill came — 'twas harvest time again —
An' the air blown over the yellow fields was sweet with the scent
o' the grain;
The dooryard was full o' the neighbors, who had come to share
our joy,
An' all of us sent up a mighty cheer at the sight o' that soldier boy.

An' all of a sudden somebody said: "My God! don't the boy
know his mother?"
An' Bill stood a-whisperin' fearful like, an' starin' from one to
another:
"Don't be afraid, Bill," said he to himself, as he stood in his coat
o' blue;
"Why, God'll take care o' you, Bill, God'll take care o' you."

He seemed to be loadin' an' firin' a gun, an' to act like a man who
hears
The awful roar o' the battle field a-sounding in his ears;
I saw that the bullet had touched his brain an' somehow made it
blind,
With the picture o' war before his eyes an' the fear o' death in his
mind.

I grasped his hand, an' says I to Bill, "Don't ye remember me?
I'm your father — don't ye know me? How frightened ye seem to
be!"
But the boy kep' a-whisperin' to himself, as if 'twas all he knew;
"God'll take care o' you, Bill, God'll take care o' you."

He's never known us since that day, nor his sweetheart, an' never
will;
Father an' mother an' sweetheart are all the same to Bill.
An' many's the time his mother sets up the whole night through,
An' smoothes his head an' says: "Yes, Bill, God'll take care o'
you."

Unfortunit? Yes, but we can't complain. It's a livin' death more
sad
When the body clings to a life o' shame an' the soul has gone to
the bad,
An' Bill is out o' the reach o' harm an' danger of every kind —
We only take care o' his body, but God takes care o' his mind.

— *Irving Bacheller.*

3. The Debatin' S'ciety.

De subject app'inted fur debate last Sadday night were, "Ef a man have a watermillion vine growin' clost to de fence, an' dat vine run over de fence into his naber's yard an' grows a watermillion dar, who do dat million b'long to?"

As dis were a question tetchin' on pints er de law, an' it hed been norated aroun' among de members dat bre'r Chrismus Towns was agwineter mek one er his famous perfessional speeches, ev'ybody 'spected dar would be a mighty incitin' debate; an' so bre'r Edom, bre'r Juber an' bre'r Thusaleh, dey was app'nted empires to jedge which side got de bessest er de argyment.

Bre'r Jerry Flagg was de fust to tek de flo'. He lowed dat he thunk de watermillion oughter b'long, uf rights, to de one on whose lan' de vine growed. "'Caze," sez he, "dat vine aint got no bissen a-runnin' off fum whar hit was planted, no mo'n a hoss or a hog aint got none a-runnin' off fum de medder whar dey feeds; an' ef dey does git out an' strays off, an' you fines 'em in yo' naber's field, dat doan mek 'em his'n; but you ketches 'em an' brings 'em home agin an' dey's jes as much yo'n as dey was befo'. An' lackwise, ef yo' chillun gits outer de house an goes over to play in yo' naber's yard, dat doan mek 'em his chillun; an I doan see no mo' reason why dat would mek it his watermillion ef yo' vine clomb over de pertition fence an' bo' a million on his side."

Den bre'r Jorum he riz up and seh:

"Misser President, hit appear to my observation dat bre'r Jerry have not took his p'int accordin' to de loginkle reason er de question, fur watermilluns an' chilluns, dey is objects so diffunt in dere natur' dat de same argyments can't imply to bofe. Now, yo' chillun an' yo' hogs an' yo' hosses an' other beases, dey is yo'n everwhar, caze dey is anamils — leastways hosses an' hogs and beases is, an' chillun, dey is livin' creeturs mos' samer den anamils while dey is young; an' so ef dey absquanders fum home you has de right to cotch 'em an' fetch 'em back agin. But watermilluns dey is vegetable perductions, an' ev'y sciumific pusson knows dat anamils and vegetables is intirely diffunt in dere natur'. Furthermo', vegetable perductions has naterl diffunces among deyselves. Dar is pertaters and perternups, fur instance, which dey grows down un'er de groun' an' has to be dug up fo' you kin eat 'em; an' dar is apples an' peaches, which dey grows high up over our head an' has to be shuk down. Now, ef yo axes me why dat apple falls down to the groun' when it air shuk off'n de tree, stider risin' up in de aar lack smoke, I answers you, in de langwidge er sciumce, becaze it air de natur' er de apple to fall. An' jes so when my deponent seh dat a watermillun vine aint got no business a-runnin off fum whar hit were planted, I answers him dat it air de natur' er de watermillun vine to run. Some vines runs one way and some ernother; some runs up an' some runs down, an' some runs all over de groun' lack de watermillun, an' if you plants dat watermillun too clost to de fence, hit's a gwinter run over it on t'other side, an' you aint got no right to tek it away funn de man over dar, 'caze it air de natur' er vines to run, an' dat watermillun air jis only a-follerin' up its natur. To put de argyment in a silly gizzard, which air de only sciumterrific motion er reasonin', hit stan' jesso:

"Dat watermillun vine have runned over de fence:

"Hit air de natur' er vines to run;

"Darfo' de watermillun on dat vine b'longsto de man on t'other side er de fence.

"Now, dar is de whole argyment abjuiced to a silly gizzard, an' I'd jes lack to see anybody try to knock de bottom outen it."

Bre'r Jorum was mightily applawded when he sot down, an' ev'ybody 'lowed dere nuver had ben sech a splendid argyment made in de s'ciety befo' an' dey could'nt see how even bre'r Chrismus was a gwineter answer all dat logink an' larnin'.

But bre'r Chrismus knowed hissef, an' he wasn't gwineter be

skeered by nobody's larnin'. He useter go to all de cotes wid his ole massa, an' had heerd jedges an' juries in his day, an' so he knowed he'd git de law on his side ef bre'r Jorum did have de logink on his'n. He was dressed up in his Sunday clo'es an' when he begun to speak his voice rolled froo de room so deep an' 'snoreous jes' lack thunder, an' de ordiumce all sot still an' listened as intente as if dey had ben prettified by his illikence.

"Misser President an' gentlemen er de jury," sez he, "right-ousnesses should be jesticeness, an' should be required at the han's uf ev'y man aforesaid, which is often inconsistency of salt an' battery; wharas, de influence er Nolly Prossekys air very enticin' to de injyment er statistics. By de violater de expectations aforesaid could not be positive in a case er hab his corpses, but de intercedence er perlarity is ve'y strong to de discouragement er de mine, as aforesaid. A gempleman er yo' cibilities have got his book an' his Bible an' his double edication. When a man has got abunnance er superfluity his frien's an' relationer is aroun' him to gin him de books on conterdiction an' a full accommendation in de States er Alabam. Look over de raiments er Alabam! I doan see nothin' wuth a gemman's attention.

"I has now splained my books on conterdiction, an' aint got nothin' mo' to seh on de supernatural charge, so I turn nex to de sublimitary regurlations er de reconnyzance. When a man have brought de plaintive er his defence to de obstruction er de Constitutional limitations, he mus' have de rights er hab his corpses fur a deplorandum deprivatium. De cote cornsiders dis question a conjunction fum de legal indicament uf its depennance on de legislative man damus to obtain de powers er de position. Darfo' be it deferred and proclaimed as aforesaid, to all men here presents, dat de writs er search yo rarry will tend to de intercedence er de persecution; an de fendents air brought to a state er consumption ad norum follerorum."

When bre'r Chrismus sot down de members all clapped an' plawded tell it look lack de house 'ud come down, an' dey was all erbleedged to give up dat his speech hed beat even bre'r Jorum's fur dar was words in it dat bre'r Jorum hisself did'nt know de meanin' on. De empires decided uranimously dat bre'r Chrismus hed gain de vict'ry fur his side. Only dey couldn't zackly mek out which side he was on, so dey couldn't say no further, ceptin' dat bre'r Chrismus's was de winnin' side, whichever side er de fence he moight think dat watermillion b'long to. — *E. F. Andrews.*

4. Wakin' the Young Uns.

The old man from the foot of the stairs — 5 A. M.]

Bee-ull! Bee-ull! O Bee-ull! my gracious,
Air you still sleepin'?
Th' hour hand's creepin'
Nearder five.
(Wal' durned ef this 'ere ain't vexatious!)
Don't ye hear them cattle callin'?
An' th' ole red steer a bawlin'?
Come, look alive!
Git up? Git up!

Mar'ann! Mar'ann! (Jist hyar her snorin'!)
Mar'ann! it's behoovin'
Thet you be amovin'
Brisk, I say!
Hyar the kitchen stove aroarin'?
The kittle's a-spilin'
To get hisse'f bilin'
It's comin' day.
Git up! Git up!

Jule, O Jule! Now whut is ailin' ?
 You want ter rest ?
 Wal' I'll be blest !
 S'pose them cows
 'Ll give down 'ithout you palin' ?
 You mus' be goin' crazy ;
 Er, more like, gittin' lazy.
 Come now, rouse.
 Git up! Git up !

Jake, you lazy varmint ! Jake! Hey, Jake!
 What you layin' theer fer?
 You know the stock's ter keer fer ;
 So, hop out !
 (Thet boy is wusser'n rock to wake !)
 Don't stop to shiver,
 But jist unkiver
 An' pop out !
 Git up ! Git up !

Young uns ! Bee-ull ! Jake ! Mar'ann ! Jule !
 (Wal' durn my orn'ry skin !
 They've gone ter sleep agin,
 Fer all my yellin' !)
 See hyar, I hain't no time ter fool !
 It's the las' warnin'
 I'll give this mornin'
 I'm done yellin' !
 Git up ! Git up !

SOLUS.

Wal' what's the odds — an hour, more or less?
 B'lieve it makes 'em stronger
 Ter sleep a leetle longer
 Thar in bed.
 The times is comin' fas' enough, I guess,
 When I'll wish, an' wish 'ith weepin'
 They was back up yonder sleepin',
 Overhead,
 Ter get up.

—John Boss.

5. Pluck and Prayer.

There wan't any use o' fretting,
 And I told Obadiah so,
 For ef we couldn't hold on to things,
 We'd just got to let 'em go.
 There were lots of folks that'd suffer
 Along with the rest of us,
 An' it didn't seem to be worth our while
 To make such a dreffle fuss.

To be sure' the barn was 'most empty,
 An' corn an' pertaters sca'ce,
 An' not much of anything plenty an' cheap
 But water — and apple-sass.
 But then — as I told Obadiah —
 It wan't any use to groan,
 For flesh and blood couldn't stan' it ; and he
 Was nothing but skin an' bone.

But laws! ef you'd only heard him,
 At any hour of the night
 A-prayin' out in that closet there
 'Twould have set you crazy quite.
 I patched the knees of those trousers
 With cloth that was no ways thin,
 But it seemed as ef the pieces were wore out
 As fast as I set 'em in.

To me he said mighty little
 Of the thorny way we trod,
 But at least a dozen times a day
 He talked it over with God.
 Down on his knees in that closet
 The most of his time was passed;
 For Obadiah knew how to pray
 Much better than how to fast.

But I am that way contrairy
 That ef things don't go jest right,
 feel like rollin' my sleeves up high
 An' gittin' ready to fight.
 An' the giants I slew that winter
 I ain't going to talk about;
 An' I didn't even complain to God,
 Though I think that He found it out.

With the point of a cambric needle
 I druv the wolf from the door;
 For I knew that we needn't starve to death
 Or be lazy because we were poor.
 An' Obadiah he wondered,
 An' kept me patching his knees,
 An' thought it strange how the meal held out,
 An' stranger we didn't freeze.

But I said to myself in whispers,
 "God knows where his gift descends;
 An' 't isn't always that faith gets down
 As far as the fingers-ends."
 An' I would not have no one reckon
 My Obadiah a shirk;
 For some, you know, have the gift to pray,
 And others the gift to work.

— *Harper's Weekly.*

Familiar Quotations.

Absence.

Absence makes the heart grow fonder. — *Bayley.*

Adornment.

Loveliness is, when unadorned, adorned the most. — *Thompson.*

Age.

Age cannot wither her, nor custom stale
 Her infinite variety. — *Shakespeare.*

Ambition.

Lowliness is young ambition's ladder. — *Shakespeare.*

Bacon and Cromwell.

If poets allure thee, think how Bacon shined,
The wisest, brightest, meanest of mankind!
Or, ravished with the whistling of a name,
See Cromwell damned to everlasting fame! — *Pope*.

Blessings.

How blessings brighten as they take their flight! — *Young*.

Brave.

None but the brave deserves the fair. — *Dryden*.

Coming Events.

'Tis the sunset of life gives me mystical lore,
And coming events cast their shadows before. — *Campbell*.

Compliance.

He that complies against his will
Is of his own opinion still. — *Butler*.

Crown.

Uneasy lies the head that wears the crown. — *Shakespeare*.

Desert air.

Full many a gem of purest ray serene
The dark, unfathom'd caves of ocean bear :
Full many a flower is born to blush unseen,
And waste its sweetness on the desert air. — *Gray*.

Distance.

'Tis distance lends enchantment to the view,
And robes the mountain in its azure hue. — *Campbell*.

Dunce.

How much a dunce that has been sent to roam,
Excels a dunce that has been kept at home. — *Cowper*.

Divinity.

There's a divinity that shapes our ends,
Rough-hew them how we will. — *Shakespeare*.

To Err.

To err is human, to forgive divine. — *Pope*.

Expectation.

Oft expectation fails, and most oft there
Where most it promises. — *Shakespeare*.

Fail.

In the lexicon of youth, which fate reserves
For a bright manhood, there is no such word
As — *fail*. — *Butler*.

Faults.

They say, best men are moulded out of faults. — *Shakespeare*.

Fools.

For fools admire, but men of sense approve. — *Pope*.

Good.

The good are better made by ill,
As odors crushed are sweeter still. — *Rogers*.

Idler.

An idler is a watch that wants both hands.
As useless if it goes as if it stands. — *Cowper*.

Learning.

A little learning is a dangerous thing. — *Pope*.

Love.

The course of true love never did run smooth. — *Shakespeare*.

Man's love is of man's life a thing apart,
'Tis woman's whole existence. — *Byron*.

Love is loveliest.

The rose is fairest when 'tis budding new,
The hope is brightest when it dawns from fears,
The rose is sweetest washed with morning dew,
And love is loveliest when embalmed in tears. — *Scott*.

Loved and Lost.

'Tis better to have loved and lost,
Than never to have loved at all. — *Tennyson*.

Name.

What's in a name? That which we call a rose
By any other name would smell as sweet. — *Shakespeare*.

He that filches from me my good name,
Robs me of that which not enriches him,
And makes me poor indeed. — *Shakespeare*.

Nature.

One touch of nature makes the whole world kin. — *Shakespeare*.

Pen.

The pen is mightier than the sword. — *Bulwer*.

Procrastination.

Procrastination is the thief of time. — *Young*.

Rest.

Absence of occupation is not rest,
A mind quite vacant is a mind distress'd. — *Cowper*.

Sport.

If all the year were playing holidays,
To sport would be as tedious as to work. — *Shakespeare*.

Tears.

If you have tears prepare to shed them now. — *Shakespeare*.

Thing of Beauty.

A thing of beauty is a joy forever. — *Keats*.

Tide.

There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows, and in miseries. — *Shakespeare*.

Ignorance.

When ignorance is bliss,
'Tis folly to be wise. — *Gray*.

Teaching.

Delightful task! to rear the tender thought,
To teach the young idea how to shoot. — *Thompson*.

Compendium of Facts AND Figures.

Land Measure and Homestead Law.

A Township is 36 sections, each a mile square or 640 acres. A quarter section, half a mile square, is 160 acres. An eighth section, half a mile long north and south, and a quarter of a mile wide, is 80 acres. A sixteenth section, a quarter of a mile square, is 40 acres.

The sections are numbered 1 to 36, commencing at northeast corner, thus:

6	5	4	3	2	NW	NE
					SW	SE
7	8	9	10	11	12	
18	17	16	15	14	13	
19	20	21	22	23	24	
30	29	28	27	26	25	
31	32	33	34	35	36	

The sections are all divided into quarters, which are named by the cardinal points, as in section 1. The quarters are divided in the same way. The description of a forty-acre lot would read: The south half of the west half of the southwest quarter of section 1, township 24, north of range 7 west, or as the case might be: and sometimes will fall short, and sometimes overrun the number of acres it is supposed to contain.

Homestead Privilege.—The laws give to every citizen, and to those who have declared their intention to become citizens, the right to a homestead on SURVEYED lands, to the extent of one quarter section, or 160 acres, or a half-quarter section, or 80 acres; the former in cases of lower-priced lands held by law at \$1.25 per acre, the latter of higher-priced lands held at \$2.50 per acre, when disposed of to cash buyers. The pre-emption privilege is restricted to heads of families, widows or single persons over the age of twenty-one.

Every soldier and officer in the army, and every seaman, marine, and officer of the navy, during the recent rebellion may enter 160 acres from either class, and length of time he served in the army or navy is deducted from the time required to perfect title.

Memorable Battles of the World.

Marathon, 490 B.C., in which the Athenians, 11,000 strong, under Miltiades, defeated the Persians, 110,000 strong, under Xerxes.

Thermopylæ. Here, 480 B.C., Leonidas, at the head of 300 Spartans, and 700 Thespians, withstood the whole force of the Persians for three days. The enemy being secretly guided to the rear of the Greeks, the latter, hemmed in between two assailants, perished gloriously, all but one man, who was held in dishonor for his flight.

Philippi. Here, 42 B.C., Octavius Cæsar and Marc Antony defeated the Republican forces of Brutus and Cassius, who, thereupon, both committed suicide.

Tours, A.D. 732, in which Charles Martel defeated the Saracens, and Europe was rescued from Islam.

Hastings, where, 1066, William, at the head of his Normans, defeated Harold commanding the Saxon English.

Bannockburn, where, 1314, 30,000 Scots, under Robert the Bruce, defeated 100,000 English under Edward II.

Lutzen. Here 1632, Gustavus Adolphus defeated the Imperialists under Wallenstein.

Spanish Armada of 132 ships, under Medina Sidonia, scattered by the English fleet, 1588.

Quebec won, 13 September, 1759, by Wolfe, from the French general, Montcalm.

Saratoga. Here, 1777, the British were finally beaten by their American colonists, henceforward the United States.

Trafalgar, off which, 1805, the British, under Nelson, gained a great victory over the combined fleets of France and Spain.

Waterloo, where, 18 June, 1815, the French, under Napoleon, were definitely driven back by the Allies under Wellington.

Sedan, where, 3 September, 1870, the Franco-German war virtually ended by the surrender of Napoleon III.

Eighteen Memorable Battles of the United States.

Lexington	April 19, 1775	Antietam	Sept. 17, 1862
Bunker Hill	June 17, 1775	Fredericksburg	Dec. 14, 1862
Cowpens	Jan. 17, 1781	Stone River	Dec. 31, 1862
Perry's victory	Sept. 10, 1813	Chancellorsville	May 1-3, 1863
New Orleans	Jan. 8, 1815	Gettysburg	July 1-3, 1863
Buena Vista	Feb. 23, 1846	Chickamauga	Sept. 20, 1863
Chapultepec	Sept. 13, 1847	Nashville	Dec. 16, 1864
Shiloh	April 7, 1862	Wilderness	May 5-7, 1864
Manassas	Aug. 30, 1862	Petersburg	June 2, 1864

Famous Destructive Fires.

New York, Dec., 1835—over five hundred buildings and \$20,000,000 worth of property destroyed; Sept. 6, 1839,—\$10,000,000 worth of property destroyed. Pittsburg, April 10, 1845,—one thousand buildings burnt; loss, \$6,000,000. St. Louis, May 4, 1851,—a large portion of the city burned; loss, \$11,000,000. Portland, Me., July 4, 1866,—almost entirely destroyed; loss, \$15,000,000. Chicago, Ill., Oct. 8-9, 1871,—over 2,000 acres burnt over; estimated loss, \$195,000,000; July 14, 1874, another great fire destroyed \$4,000,000 worth of property. Boston, Mass., Nov. 9, 1872,—nearly 450 buildings destroyed; loss over \$73,000,000. St. John, N.B., June 21, 1877; loss \$12,500,000.

Curiosities of the Bible.

The Bible contains 3,566,480 letters, 773,746 words, 31,173 verses, 1189 chapters, and 66 books. The word *and* occurs 46,277 times. The word *Lord* occurs 1855 times. The word *reverend* occurs but once, which is the 9th verse of the 111th Psalm. The middle verse is the 8th verse of the 118th Psalm. The 21st verse of the

7th chapter of Ezra contains all the letters of the alphabet, except the letter J. The longest verse is the 9th verse of the 8th chapter of Esther. The shortest verse is the 35th verse of the 11th chapter of St. John. There are no words or names of more than 6 syllables.

The Lady's Chance of Marrying.

Representing a woman's entire chance of marrying at one hundred, the following will be the proportions at her different periods of life :

Between the ages of	15 and 20 years	14½ per cent.
"	" 20 " 25 "	52 "
"	" 25 " 30 "	18 "
"	" 30 " 35 "	15⅓ "
"	" 35 " 40 "	3¾ "
"	" 40 " 45 "	2½ "
"	" 45 " 50 "	¾ of 1 "
"	" 50 " 56 "	¼ of 1 "

After sixty it is one tenth of one per cent., or one chance in a thousand.

Words in the English Language.

Shakespeare, who had the richest vocabulary used by any Englishman, employed only 16,000 words. Milton could pick out from 8,000; but the average man, a graduate from one of the great universities, rarely has a vocabulary of more than 3000 or 4000 words. The ordinary person can get along very comfortably with 5000 words, and in the rural districts a knowledge of 200 words is sufficient to carry a man through his life. This of course refers to the needs of conversation. If a man wants to read newspapers and well-written books, he must know at least 2,000 words.

Why is Food Required ?

The question seems almost absurd, so familiar is the fact; and yet the answer to it involves one of the grandest chapters in the history of science. In its simplest form it may be given in three words: it is fuel. We require food frequently, for just the same reason that a fire requires coal frequently and a lamp oil — because we are burning away. The air that we breathe into our lungs contains oxygen, and this oxygen combines with, or burns, the muscles or other organs of our bodies just as it does the coals in a fire. About 30 oz. of oxygen a day are thus consumed, requiring about 12 oz. of carbon to replace the waste, or say 3 lbs. of bread. The heat produced in a man's body in the course of a day is considerable in quantity, though not very intense in quality. Taking the average, it is enough to raise five and a half gallons of water from freezing-point to boiling-point, and this is about the heat that would be given off during the burning of a pound of coal. All this heat comes from slow wasting or burning of the substance of the body, so that it is evident that if we did not make up for this constant loss by eating food, our organs would soon be wasted away and consumed.

Curiosities in Figures.

A very curious number is 142,857, which multiplied by 1, 2, 3, 4, 5, or 6 gives the same figures in the same order, beginning at a different point; but if multiplied by seven gives all nines: Multiplied by 1 it equals 142,857; multiplied by 2 equals 285,714; multiplied by 3 equals 428,571; multiplied by 4 equals 571,428; multiplied by 5 equals 714,285; multiplied by 6 equals 857,142; multiplied by 7 equals 999,999. Multiply 142,857 by 8 and you have 1,142,856. Then add the first figure to the last and you have 142,857, the original number, the figures exactly the same as at the start. Another mathematical wonder is the following: It is dis-

covered that the multiplication of 9, 8, 7, 6, 5, 4, 3, 2, 1, by 45 gives 44, 44, 44, 44, 44, 45. Reversing the order of the digits and multiplying 1, 2, 3, 4, 5, 6, 7, 8, 9 by 45, we get a result equally curious—5, 55, 555, 505. If we take 1, 2, 3, 4, 5, 6, 7, 8, 9 as the multiplicand, and interchanging the figures of 45 take 54 as the multiplier, 6, 666, 666, 606. Returning to the multiplicand 9, 8, 7, 6, 5, 4, 3, 2, 1, and taking 54 as the multiplier again, 53, 333, 333, 34—all 3's except the first and last figures, which together read 54, the multiplier. Taking the same multiplicand and 27, the half of 54, as the multiplier we get a product of 26, 666, 666, 667—all 6's except the first and last figures, which together read 27, the multiplier. Now interchanging the order of the figures 27, and using 72 as the multiplier, and 9, 8, 7, 6, 5, 4, 3, 2, 1 as the multiplicand, we get a product of 71, 111, 111, 112—all 1's except the first and last figures, which together read 72, the multiplier.

Wedding Anniversaries.

First—Cotton Wedding.	Fifteenth—Crystal Wedding.
Second—Paper Wedding.	Twentieth—China Wedding.
Third—Leather Wedding.	Twenty-fifth—Silver Wedding.
Fifth—Wooden Wedding.	Thirtieth—Pearl Wedding.
Seventh—Woollen Wedding.	Fortieth—Ruby Wedding.
Tenth—Tin Wedding.	Fiftieth—Golden Wedding.
Twelfth—Silk Wedding.	Seventy-fifth—Diamond Wedding.

Starboard and Larboard.

In Saxon *bord* means shield. In the Viking ships each warrior hung his shield on the side of the ship opposite to him, and above the aperture for his oar. The Viking held the steer oar, which was fastened to the right-hand side of the stern (stern itself is a contraction of steer oar). The right-hand side of the ship thus became the steer side; and as board came to mean the whole side where the shields, or bords, were hung, the right side came to be the steer board (starboard) side, and the lower or lurking side became larboard.

Wonders of the Heavens.

There are 18 stars of the first magnitude. These are at least 211,000 times farther from the earth than is the sun, and their light takes over 3 years to reach us. There are 55 of the second magnitude, their light taking over 6 years to reach us; 170 of the third magnitude, their light reaching us in over 9 years; 500 of the fourth magnitude, their light taking 12 years to reach us. Stars as distant as those of the sixth magnitude, their light taking 36 years to traverse the intervening space, are visible to the naked eye. Of these there are about 6000. A 9-foot telescope reveals stars of the twelfth magnitude, about 10,000,000 in number. An 18-foot telescope reveals about 43,000,000 stars, including those of the 13th magnitude, whose light takes 2700 years to reach us. Each of these stars is thought to be the centre of a solar system like our own. Our own solar system consists of the Sun, and the following planets revolving around it: Mercury, nearest the Sun, is 35,000,000 miles distant; Venus, 66,000,000 miles; the Earth, 91,000,000 miles; Mars, 139,000,000 miles; the Asteroids, about 266,000,000 miles; Jupiter, nearly 476,000,000 miles; Saturn, 872,000,000 miles; Uranus, 1,754,000,000 miles; and Neptune, 2,746,000,000 miles from the Sun.

How to Remove Tight Finger Rings.

Pass the end of a picce of fine twine underneath the ring, and wind it evenly around the finger upward as far as the middle joint. Then take hold of the lower end of the string beneath the ring, and begin to slowly unwind upward, when the ring will gradually move along the twine toward the tip of the finger and come off.

Remarriage.

There are no restrictions upon remarriage by divorced persons in Arizona, Connecticut, Kentucky, Maine, and Illinois. Either party may remarry, but defendant (or either party in Kansas and Minnesota) must wait two years in Massachusetts, three years in Vermont, six months in Kansas, five years in Missouri, the time allowed for appeal in Nebraska, Oregon, and Washington. The decree of the court may restrain the guilty party from remarrying in Alabama, Georgia, Maryland, Mississippi, and Virginia. Parties cannot remarry, except by permission of the court, in Maine. In Dakota and New York, the plaintiff may remarry, but the defendant, divorced for violation of the marriage vow, cannot do so during the plaintiff's lifetime, unless the decree be modified or proof that five years have elapsed and that complainant has married again and defendant's conduct has been uniformly good. Any violation of this is punished as bigamy, even though the other party has been married. In Delaware, Pennsylvania, and Tennessee, no wife or husband divorced for violation of the marriage vow can marry the *particeps criminis* during the life of the former husband or wife, nor in Louisiana at any time; such marriage in Louisiana renders the person divorced guilty of bigamy.

Digestion of Food.

The following table shows the time, in hours and minutes, required for the digestion of the more common articles of food:

KIND OF FOOD.	H	M	KIND OF FOOD	H	M
Rice, boiled	1	00	Eggs, soft-boiled	3	00
Eggs, whipped	1	30	Beefsteak, broiled	3	00
Trout, fresh, fried	1	30	Mutton, broiled	3	00
Soup, barley, boiled	1	30	Mutton, boiled	3	00
Apples, sweet, raw	1	30	Soup, bean, boiled	3	00
Venison steak, broiled	1	30	Chicken soup, boiled	3	00
Sago, boiled	1	45	Pork, salt, boiled	3	15
Tapioca, boiled	2	00	Mutton, roasted	3	15
Barley, boiled	2	00	Bread, corn, baked	3	15
Milk, boiled	2	00	Carrot, boiled	3	15
Liver, beef, broiled	2	00	Sausage, broiled	3	20
Eggs, fresh, raw,	2	00	Oysters, stewed	3	30
Apples, sour, raw,	2	00	Butter	3	30
Cabbage, raw	2	00	Cheese, old	3	30
Milk	2	15	Bread, fresh-baked	3	30
Eggs, roasted	2	15	Turnips, flat, boiled	3	30
Goose, roasted	2	30	Potatoes, Irish, boiled	3	30
Turkey, roasted	2	30	Eggs, hard-boiled	3	30
Cake, sponge, baked	2	30	Green corn, boiled	3	45
Hash, warmed	2	30	Beans and beets, boiled	3	45
Beans, pod, boiled	2	30	Salmon, salted, boiled	4	00
Parsnips, boiled	2	30	Veal, fresh, fried	4	30
Custard, baked	2	50	Cabbage, boiled	4	30
Oysters, raw	2	55	Suet, beef, boiled	5	30

The Longest Bridges in the World.

The length of some of the longest bridges in the world are as follows: Montreal, 8,701 feet long. Brooklyn, 5,989 feet long. Dnieper, 4,213 feet long. The new Havre de Grace bridge, 6,000 feet long. Bridge at Homestead, near Pittsburg, Pa., 5,300 feet long. China has the longest bridge in the world; it is 23,000 feet long; its roadway is 70 feet wide and 70 feet high; there are 300 arches, and each of the pillars, which are 75 feet apart, bears a pedestal on which is the figure of a lion 21 feet long, and made out of one block of marble.

The United States and Territories.

States and Territories.	Popular Name.	Area in Sq. Miles.	Population. Census 1890.
Alabama	Cotton	52,250	1,513,017
Alaska .....	.....	577,390	38,000
Arizona .....	.....	113,020	59,620
Arkansas	Bear	53,850	1,128,179
California	Golden	158,360	1,208,130
Colorado	Centennial	103,925	412,198
Connecticut	Nutmeg	4,990	746,258
Delaware	Blue Hen	2,050	168,493
District of Columbia .....	.....	70	230,392
Florida	Peninsular	58,680	391,432
Georgia	Cracker	59,475	1,837,353
Idaho .....	.....	84,800	84,385
Illinois	Sucker	56,650	3,826,351
Indian Territory ..	.....	64,690	345,000
Indiana	Hoosier	36,350	2,112,404
Iowa	Hawkeye	56,025	1,911,896
Kansas	Sunflower	82,080	1,427,096
Kentucky	Bluegrass	40,400	1,858,635
Louisiana	Pelican	48,720	1,118,587
Maine	Pine Tree	33,040	661,086
Maryland	Old Line	12,210	1,043,380
Massachusetts	Bay	8,315	2,238,943
Michigan	Wolverine	58,915	2,093,889
Minnesota	Gopher	83,350	1,301,826
Mississippi	Bayou	46,810	1,289,600
Missouri .....	.....	69,415	2,679,184
Montana .....	.....	146,080	132,159
Nebraska	Black Water	76,855	1,058,910
Nevada	Silver	110,700	45,761
New Hampshire	Granite	9,305	376,530
New Jersey .....	.....	7,815	1,444,953
New Mexico .....	.....	122,580	153,593
New York	Empire	49,170	5,997,853
North Carolina	Old North	52,250	1,617,947
North Dakota .....	.....	70,795	182,719
Ohio	Buckeye	41,060	3,672,316
Oregon	Beaver	96,030	313,767
Pennsylvania	Keystone	45,215	5,258,014
Rhode Island .....	.....	1,250	345,506
South Carolina	Palmetto	30,570	1,151,149
South Dakota .....	.....	77,650	328,808
Tennessee	Volunteer	42,050	1,767,518
Texas	Lone Star ..	265,780	2,235,523
Utah .....	.....	84,070	207,905
Vermont	Green Mountain	9,565	332,422
Virginia	Old Dominion ..	42,405	1,655,980
Washington .....	.....	69,180	349,390
West Virginia .....	.....	24,780	762,794
Wisconsin	Badger	56,040	1,680,880
Wyoming .....	.....	97,890	60,705

Greatest Known Depth of the Ocean.

The greatest depth which has been ascertained by sounding is five miles and a quarter (25,720 feet, or 4,620 fathoms), not quite equal to the height of the highest known mountain, Mount Everest, which measures 29,002 feet, or 5½ miles high. The average depth between 60 degrees north and 60 degrees south, is nearly three miles.

Presidents of the United States.

PRESIDENTS OF THE U.S.	State.	Politics.	Date Election
George Washington.....	Virginia.	Federalist,	Jan. 7, 1789
John Adams.....	Mass.	"	Nov. 8, 1796
Thomas Jefferson.....	Virginia.	Dem. Rep.	Nov. 11, 1800
James Madison.....	"	"	Nov. 8, 1808
James Monroe.....	"	"	Nov. 12, 1816
John Quincy Adams....	Mass.	Coalition	Nov. 9, 1824
Andrew Jackson.....	Tenn.	Democrat.	Nov. 11, 1828
Martin Van Buren.....	New York.	"	Nov. 8, 1836
Wm. Henry Harrison...	Ohio.	Whig	Nov. 10, 1840
John Tyler.....	Virginia.	....	....
James K. Polk.....	Tenn.	Democrat.	Nov. 12, 1844
Zachary Taylor.....	Louisiana	Whig.	Nov. 7, 1848
Millard Fillmore.....	New York.	....	....
Franklin Pierce.....	N. Hamp.	Democrat.	Nov. 2, 1852
James Buchanan.....	Penn.	"	Nov. 4, 1856
Abraham Lincoln.....	Illinois.	Republican.	Nov. 6, 1860
Andrew Johnson.....	Tenn.	....	....
Ulysses S. Grant.....	Illinois.	Republican.	Nov. 3, 1868
Rutherford B. Hayes...	Ohio.	"	Nov. 7, 1876
James A. Garfield.....	"	"	Nov. 2, 1880
Chester A. Arthur.....	New York.	....	....
Grover Cleveland.....	"	Democrat.	Nov. 4, 1884
Benjamin Harrison.....	Indiana.	Republican.	Nov. 6, 1888

The Washington Monument.

The corner-stone was laid by President Polk, July 4th, 1848, and December 6, 1884, the cap-stone was set in position. The foundations are 126½ feet square and 36 feet 8 inches deep. The base of the monument is 55 feet 1½ inches square, and the walls 15 feet ¼ inch thick. At the 500 foot mark, where the pyramidal top begins, the shaft is 34 feet 5½ inches square and the walls are 18 inches thick. The monument is made of blocks of marble 2 feet thick, and it is said there are over 18,000 of them. The height above the ground is 555 feet. The pyramidal top terminates in an aluminum tip, which is 9 inches high and weighs 100 ounces. The mean pressure of the monument is 5 tons per square foot, and the total weight, foundation and all, is nearly 81,000 tons. The door at the base, facing the capitol, is 8 feet wide and 16 feet high, and enters a room 25 feet square. An immense iron framework supports the machinery of the elevator, which is hoisted with steel wire ropes two inches thick. At one side begins the stairs, of which there are fifty flights, containing eighteen steps each. Five hundred and twenty feet from the base there are eight windows, 18 x 24 inches, two on each face. The area at the base of the pyramidal top is 1,187¼ feet, space enough for a six-room house, each room to be 12 x 16 feet. The Cologne Cathedral is 525 feet high; the pyramid of Cheops, 486; Strasburg Cathedral, 474; St. Peter's at Rome, 448; the Capitol at Washington, 306, and Bunker Hill Monument, 221 feet. The Washington Monument, therefore, is the highest structure in the world. Externally the monument is complete, but it will take two years to complete the interior. When done the total cost will aggregate not far from \$1,500,000.

Languages of the World.

It is estimated that over 100 millions of people now speak the English language, over 41 millions the French, 69 millions German, 30 millions Italian, 41 millions Spanish, 13 millions Portuguese, and 67 millions Russian.

Casualties in Greatest Battles of Civil War.

Battle.	Killed.	FEDERAL.		CONFEDERATE.		
		Wound- ed.	Miss- ing.	Killed.	Wound- ed	Miss- ing.
Gettysburg.....	3,070	14,497	5,434	2,592	12,706	5,150
Spottsylvania.....	2,725	13,413	2,258	....	....	....
Wilderness.....	2,246	12,037	3,383	....	....	....
Antietam.....	2,108	9,549	753	....	....	....
Chancellorsville..	1,606	9,762	5,919	1,665	9,081	2,018
Chickamauga.....	1,656	9,749	4,774	2,268	13,613	1,090
Cold Harbor.....	1,844	9,077	1,816	....	....	....
Fredericksburg....	1,284	9,600	1,769	596	4,068	651
Manassass.....	1,747	8,452	4,263	....	....	....
Shiloh.....	1,754	8,408	2,885	1,723	8,012	959
Stone's River....	1,730	7,802	3,717	1,294	7,945	1,027
Petersburg (ass't)	1,688	8,513	1,185	....	....	....

Marriage Age in Different Countries.

In Austria, 14 years for both sexes. Germany, the man at 18, the woman at 14. Belgium, the man at 18, the woman at 15. In Spain, the man at 14, the woman at 12. France, the man at 18, the woman at 15. Greece, the man at 14, the woman at 12. Hungary — Catholics, the man at 14, the woman at 12; Protestants, the man at 18, the woman at 15. Portugal, the man at 14, the woman at 12. Russia, the man at 18, the woman at 16. Saxony, the man at 18, the woman at 16. Switzerland, the man at 14, the woman at 12. Turkey, at puberty.

The Pulse.

Ages.	Beats per Minute.	Ages.	Beats per Minute.
At birth.....	130 to 140	Seven years.....	85
One month.....	120	Puberty.....	85 to 80
One year.....	120 to 108	Adult age.....	75 to 70
Two years.....	108 to 90	Old age.....	65 to 60
Three years.....	90 to 80		

The Law of Finding.

The law of finding is this: The finder has a clear title against the whole world except the owner. The proprietor of a hotel or a shop has no right to demand the property or premises. Such proprietor may make regulations in regard to lost property which will bind their employes, but they cannot bind the public. The law of finding was declared by the King's bench over 100 years ago, in a case in which the facts were these:

A person found a wallet containing a sum of money on a shop floor. He handed the wallet and contents to the shopkeeper to be returned to the owner. After three years, during which the owner did not call for his property, the finder demanded the wallet and the money from the shopkeeper. The latter refused to deliver them up on the ground that they were found on the premises. The former then sued the shopkeeper, and it was held as above set forth, that against all the world but the owner, the title of the finder is perfect. And the finder has been held to stand in the place of the owner, so that he was permitted to prevail in an action against a person who found an article which the plaintiff had originally found, but subsequently lost. The police have no special rights in regard to articles lost, unless those rights are conferred by statute. Receivers of articles found are trustees for the owner or finder. They have no power in the absence of special statute to keep an article against the finder, any more than the finder has to retain an article against the owner.

The Great Canals of the World.

The Imperial canal of China is over 1,000 miles long. In the year 1861 was completed the greatest undertaking of the kind on the European continent, the canal of Languedoc, or the Canal du Midi, to connect the Atlantic with the Mediterranean; its length is 148 miles, it has more than 100 locks, and about 50 aqueducts, and its highest part is no less than 600 feet above the sea; it is navigable for vessels of upward of 100 tons. The largest ship canal in Europe is the great North Holland canal, completed in 1825—125 feet wide at the water surface, 31 feet wide at the bottom, and has a depth of 20 feet; it extends from Amsterdam to the Helder, 51 miles. The Caledonia canal in Scotland, has a total length of 60 miles, including 3 lakes. The Suez canal is 88 miles long, of which 66 miles are actual canal. The Erie canal is 350½ miles long; the Ohio canal, Cleveland to Portsmouth, 332; the Miami and Erie, Cincinnati to Toledo, 291; the Wabash and Erie, Evansville to the Ohio line, 374.

Formula for Telling a Girl's Age.

Girls of a marriageable age do not like to tell how old they are; but you can find out by following the subjoined instructions, the young lady doing the figuring: Tell her to put down the number of the month in which she was born, then to multiply it by 2, then to add 5 then to multiply it by 50, then to add her age, then to subtract 365, then to add 115, then tell her to tell you the amount she has left. The two figures to the right will tell you her age, and the remainder the month of her birth. For example, the amount is 822; she is 22 years old and was born in the eighth month, (August.) Try it.

Estimating Measures.

A pint of water weighs nearly 1 lb., and is equal to about 27 cubic inches, or a square box 3 inches long, 3 inches wide and 3 inches deep.

A quart of water weighs nearly 2 lbs., and is equal to a square box of about 4 x 4 inches and 3½ inches deep.

A gallon of water weighs from 8 to 10 lbs., according to the size of the gallon, and is equal to a box 6 x 6 inches square and 6, 7 or 7½ inches deep.

A peck is equal to a box 8 x 8 inches square and 8 inches deep.

A bushel almost fills a box 12 x 12 inches square and 24 inches deep, or 2 cubic feet.

A cubic foot of water weighs nearly 64 lbs., (more correctly, 62½ lbs.) and contains from 7 to 8 gallons, according to the kind of gallons used.

A barrel of water almost fills a box 2 x 2 feet square and 1½ feet deep, or 6 cubic feet.

Petroleum barrels contain 40 gallons, or nearly 5 cubic feet.

How to Measure Corn or Hay.

This rule will apply to a crib of any size or kind. Two cubic feet of good sound, dry corn in the ear will make a bushel of shelled corn. To get, then, the quantity of shelled corn in a crib, of corn in the ear, measure the length, breadth and height of the crib inside of the rail; multiply the length by the breadth and the product by the height; then divide the product by two, and you have the number of bushels of shelled corn in the crib.

To find the number of bushels of apples, potatoes, etc., in a bin, multiply the length, breadth and thickness together, and this product by 8, and point off one figure in the product for decimals.

To find the amount of hay in a mow, allow 512 cubic feet for a ton, and it will come out very generally correct.

Signs of the Tongue.

The tongue is the indicator of the system. A white coated tongue indicates febrile disturbance; a brown, moist tongue indicates disordered digestion or overloaded passages; a brown, dry tongue indicates depressed vitality, as in typhoid conditions and blood poisoning; a red, moist tongue indicates debility, as from exhausting discharges; a red, dry tongue indicates pyrexia, or any inflammatory fever; a "strawberry" tongue, with prominent papillæ, indicates scarlet fever, or rotheln; a red, glazed tongue indicates debility, with want of assimilative power of digestion; a tremulous, flabby tongue indicates delirium tremens; hesitancy in protruding the tongue indicates concussion of the brain.

Carrying Capacity of a Ten-ton Freight Car.

Whiskey,	60 barrels.	Lumber,	6,000 feet.
Salt,	70 "	Barley,	300 bushels.
Lime,	70 "	Wheat,	340 "
Flour,	90 "	Flaxseed,	360 "
Eggs,	130 to 160 "	Apples,	370 "
Flour,	200 sacks.	Corn,	400 "
Wood,	6 cords.	Potatoes,	430 "
Cattle,	18 to 20 head.	Oats,	680 "
Hogs,	50 to 60 "	Bran,	1,000 "
Sheep,	80 to 100 "	Butter,	20,000 pounds.

How to Start a Balky Horse.

Take the horse out of the shafts and make him go round in a circle till he is giddy; you will not have to do it more than twice.

Mason and Dixon's Line.

A name given to the southern boundary line of the FREE State of Pennsylvania which formerly separated it from the SLAVE States of Maryland and Virginia. It was run — with the exception of about twenty-two miles — by Charles Mason and Jeremiah Dixon, two English mathematicians and surveyors, between Nov. 15, 1763, and Dec. 26, 1767. During the excited debate in Congress in 1820, on the question of excluding slavery from Missouri, the eccentric John Randolph of Roanoke made great use of this phrase, which was caught up and re-echoed by every newspaper in the land, and thus gained a celebrity which it still retains.

The President's Salary.

The sum of \$36,064 is given to the President in addition to his salary of \$50,000, to pay the salaries of his subordinates and clerks. His private secretary is paid \$3,250, his assistant private secretary \$2,250, his stenographer \$1,800, five messengers, each, \$1,200, a steward \$1,800, two door keepers, each \$1,200, four other clerks at good salaries, one telegraph operator, two ushers, \$1,200 and \$1,400, a night usher, \$1,200, a watchman \$900, and a man who takes care of the fires who receives \$864 a year. In addition to this, there is given him \$8,000 for incidental expenses, such as stationery, carpets, and the care of the presidential stables. And under another heading there is given him nearly \$40,000 more. Of this \$12,500 is for repairs and refurnishing the white house, \$2,500 is for fuel, \$4,000 is for the greenhouse, \$15,000 is for gas, matches and the stable. The white house, all told, costs the country in connection with the President, considerably over \$125,000 a year.

Railway Signal Code.

One whistle signifies "down brakes." Two whistles signify "off brakes." Three whistles signify "back up." Continued

whistles signify "danger." Rapid, short whistles "a cattle alarm." A sweeping parting of the hands on the level with the eyes, signifies "go ahead." Downward motion of the hands with extended arms, signifies "stop." Beckoning motion of one hand, signifies "back." Red flag waved up the track, signifies "danger." Red flag stuck up by the roadside, signifies "danger ahead." Red flag carried on a locomotive, signifies "an engine following." Red flag hoisted at a station, is a signal to "stop." Lanterns at night raised and lowered vertically, is a signal "to start." Lanterns swung at right angles across the track, means "stop." Lanterns swung in a circle, signifies "back the train."

Results of Saving Small Amounts of Money.

The following shows how easy it is to accumulate a fortune, provided proper steps are taken. The table shows what would be the result at the end of fifty years by saving a certain amount each day and putting it at interest at the rate of six per cent:

Daily Savings.	The Result.	Daily Savings.	The Result.
One cent,	\$ 950	Sixty cents,	\$57,024
Ten cents,	9,504	Seventy cents,	66,528
Twenty cents,	19,006	Eighty cents,	76,032
Thirty cents,	28,512	Ninety cents,	85,537
Forty cents,	38,015	One dollar,	95,041
Fifty cents,	47,520	Five dollars,	475,208

Nearly every person wastes enough in twenty or thirty years, which, if saved and carefully invested, would make a family quite independent; but the principle of small savings has been lost sight of in the general desire to become wealthy.

Legal Holidays in the United States.

New Year's Day — January 1 — In all States and Territories, except Arkansas, Delaware, Georgia, Kentucky, Maine, Massachusetts, New Hampshire, North Carolina, South Carolina and Rhode Island.

Anniversary of the Battle of New Orleans — January 8 — In Louisiana.

Lincoln's Birthday — February 12 — In Louisiana.

Washington's Birthday — February 22 — In all States and Territories, except Alabama, Arkansas, Florida, Illinois, Iowa, Indiana, Kansas, Maine, Missouri, North Carolina, Ohio, Texas, Oregon and Tennessee.

Shrove Tuesday — in Louisiana, and cities of Mobile, Montgomery and Selma, Alabama.

Anniversary of Texan Independence — March 2 — In Texas.

Firemen's Anniversary — March 4 — In Louisiana.

Good Friday — April 15 — In Florida, Louisiana, Minnesota and Pennsylvania.

Memorial Day — April 26 — In Georgia.

Battle of San Jacinto — April 21 — In Texas.

Decoration Day — May 30 — In Colorado, Maine, Vermont, Connecticut, Michigan, New Hampshire, New Jersey, Rhode Island, New York, Pennsylvania and District of Columbia.

Fourth of July — In all States and Territories.

General Election Day — Generally on Tuesday after first Monday in November — In California, Maine, Missouri, New Jersey, New York, Oregon, South Carolina and Wisconsin.

Thanksgiving Day — Usually last Thursday in November — and Fast days whenever appointed by the President — are legal holidays in all States and Territories.

Christmas Day — In all the States and Territories.

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